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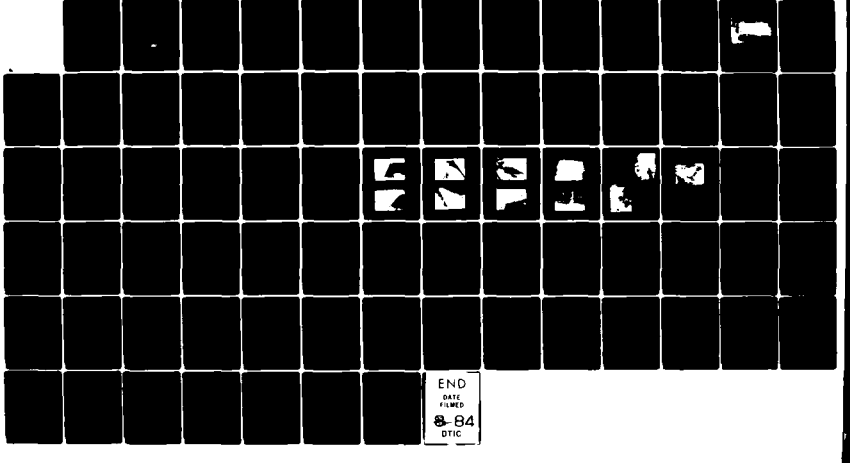

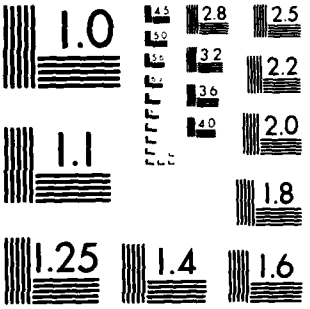

CONNECTICUT WESTERN COASTAL AREA
NEW CANAAN, CONNECTICUT

JOHN D. MILNE DAM
CT 00058

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

AUGUST 1978

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Conn. Western Coastal Area
New Canaan, Conn.
John D. Milne Dam

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The dam is a linear concrete gravity structure with a central spillway. The upstream face of the dam is vertical. The downstream face is vertical for 7.5 ft. below the top of the dam and then slopes at 7 horizontal to 10 vertical. The spillway is concrete with an "ogee" shape.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:

NEDED

SEP 28 1978

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

I am forwarding to you a copy of the John D. Milne Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, The First District Water Company of the First Taxing District, 3 Belden Avenue, Norwalk, Connecticut 06850.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

JOHN D. MILNE DAM

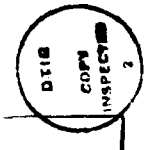
CT 00058

CONNECTICUT WESTERN COASTAL AREA

NEW CANAAN, CONNECTICUT

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM



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PHASE I REPORT

NATIONAL DAM SAFETY PROGRAM

Name of Dam: JOHN D. MILNE DAM

State Located: Connecticut

County Located: Fairfield County

Stream: Silvermine River

Date of Inspection: 1 JUNE 1978

BRIEF ASSESSMENT

The dam is a linear concrete gravity structure with a central spillway. The upstream face of the dam is vertical. The downstream face is vertical for 7.5 feet below the top of the dam and then slopes at 7 horizontal to 10 vertical. The spillway is concrete with an "ogee" shape.

Based on the visual inspection of the site, review of available information and past performance of the dam, the dam is judged to be in good condition.

The spillway will pass the test flood without overtopping the dam, and therefore the spillway capacity is adequate.

Additional investigations to further assess the adequacy of the dam and appurtenant structures do not appear necessary. Patching of deteriorated concrete, initiated by the owner, should be continued. Additionally, during periods of unusually high precipitation, round the clock surveillance should be provided.

S. Giavara

S. Giavara, P.E.
Principal

Registered, CT 7634

This Phase I Inspection Report on John D. Milne Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Charles G. Tiersch

CHARLES G. TIERSCH, Chairman
Chief, Foundation and Materials Branch
Engineering Division

Fred J. Ravens Jr

FRED J. RAVENS, Jr., Member
Chief, Design Branch
Engineering Division

Saul Cooper

SAUL COOPER, Member
Chief, Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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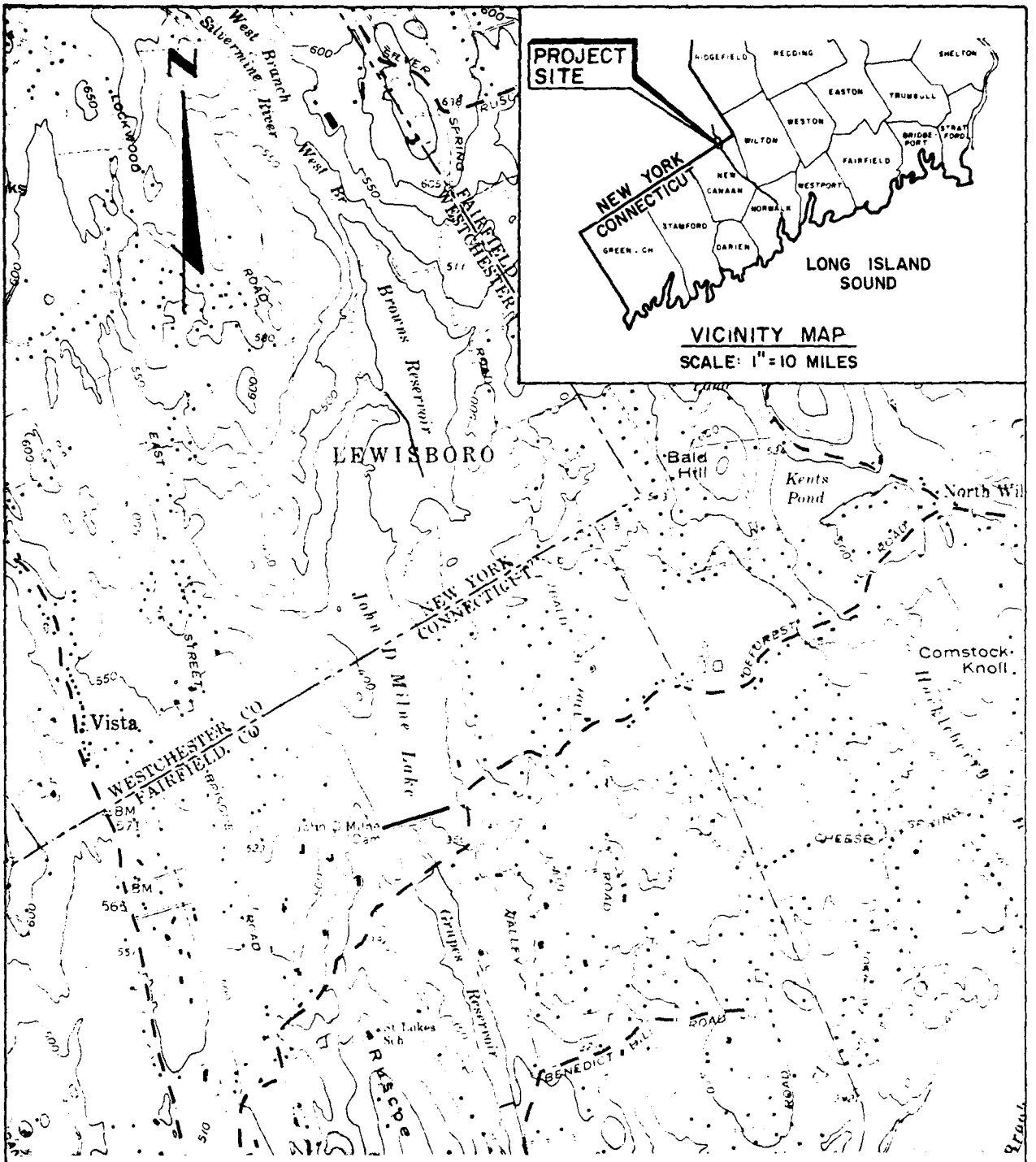
JOHN D. MILNE DAM



LOCATION MAP

JOHN D. MILNE DAM
NEW CANAAN, CONNECTICUT

PHASE I INSPECTION REPORT
JOHN D. MILNE DAM CT 00058

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL:

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection through the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Flaherty Giavara Associates, P.C. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to Flaherty Giavara Associates, P.C. under a letter of 25 April 1978 from Ralph T. Garver, Colonel, Corps of Engineer. Contract No. DACW33-78-C-0309 has been assigned by the Corps of Engineers for this work.

b. Purpose:

1) Perform technical inspection and evaluation of non-federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-federal interests.

2) Encourage and assist the States to initiate quickly effective dam safety programs for non-federal dams.

3) To update, verify and complete the National Inventory of Dams.

1.2 DESCRIPTION OF PROJECT:

a. Description of Dam and Appurtenances. The dam is a linear concrete gravity structure with a central spillway. The upstream face of the dam is vertical. The downstream face is vertical for 7.5 feet below the top of the dam and then slopes at 7 horizontal to 10 vertical. The top width is 9 feet with a solid concrete parapet wall along the upstream edge and an iron pipe railing along the downstream edge. The top walkway is discontinuous at the spillway. The spillway is concrete, 200 feet long with an "Ogee" shape. Flashboards are in place along the entire spillway crest. The bottom of the spillway has a flip bucket, 12 feet below the normal water surface elevation, with an end inclination of 45 degrees with the horizontal.

b. Location. The John D. Milne Dam is located on Silvermine River, within the Connecticut western coastal area, in the Town of New Canaan. The dam site is located about 8 miles northwesterly of the City of Norwalk. The reservoir extends northerly into the Township of Lewisboro, New York.

c. Size Classification. The applicable guidelines indicate that for an intermediate category the storage in acre-feet for the impoundment must be greater or equal to 1,000 and less than 50,000. The height must be greater than or equal to 40 feet and less than 100 feet. The top of dam storage is 1,870 acre-feet and the height of dam is 75 feet. Based on both the storage capacity and height of the dam, the size classification is intermediate.

d. Hazard Classification. The dam is designated as having a high hazard potential. Approximately 100 houses are located in the area that would be effected by a dam failure flood. The Town of Norwalk is located along the Silvermine River six miles downstream of the project site. Serious damage to the Merritt Parkway and the Connecticut Turnpike could also be caused.

e. Ownership. The dam is owned by the First District Water Company of the First Taxing District, Norwalk, Connecticut.

f. Purpose of Dam. The John D. Milne Dam's function is to impound water for the John D. Milne Reservoir. This reservoir forms part of the water company's water distribution system and supplies a portion of the City of Norwalk.

g. Design and Construction History. The dam was designed by Buck, Seifert, Jost, Inc. of New York in 1945, and was constructed by E. W. Foley Associates Company, Inc. of Brooklyn, New York during the years 1945 through 1947.

h. Normal Operational Procedure. The reservoir is utilized for drinking water by taking water through one of four separate 30-inch sluice gates equipped with rising stem screen racks. A 24-inch outlet line delivers water to Grupes Reservoir downstream, and to the New Canaan pump station. A 12-inch cone valve, regulating a 24-inch outline line provides for blow off. The blow off is operated periodically to ensure proper functioning. The spillway section is equipped with 1-foot splash boards and the reservoir level is maintained as high as possible throughout the year by controlling both the inflow (from Browns Reservoir) and the outflow. The surface water is seldom less than 3 feet below the spillway elevation, and the spillway is usually discharging water continuously through the

winter and into late spring. On a daily basis, the First District Water Company performs a routine check of the dam structure and reservoir. The blow off is left in a slightly open position to maintain flow downstream.

1.3 PERTINENT DATA:

a. Drainage Area -	9.5 sq. miles
b. Discharge at Dam Site -	
Maximum Known Flood	Unknown
Warm Water Outlet	Not Applicable
Div. Tunnel Low Pool Outlet	Not Applicable
Diversion Tunnel Outlet	Not Applicable
Gated Spillway	Not Applicable
Ungated Spillway at Max. Pool	17,260 CFS
Total Spillway Cap. at Max. Pool	17,260 CFS
c. Elevation (above M.S.L.) -	
Top of Dam	375
Max. Design Pool	378(±) (3' high parapet wall)
Full Flood Control Pool	Not Applicable
Recreation Pool	Not Applicable
Spillway Crest Ungated	370
Upstream Portal Invert. Div. Tunnel	Not Applicable
Downstream Portal Invert. Div. Tunnel	Not Applicable
Streambed at Centerline of Dam	300
Maximum Tailwater	310(±)
d. Reservoir -	
Length of Max. Pool	5,000 Ft.
Length of Recreation Pool	Not Applicable
Length of Flood Control Pool	Not Applicable
e. Storage -	
Recreation Pool	Not Applicable
Flood Control Pool	Not Applicable
Design Surcharge	Not Available
Top of Dam	1,870 Acre-Feet
f. Reservoir Surface (acres) -	
Top of Dam	69.6
Max. Pool	Not Applicable
Flood Control Pool	Not Applicable
Recreation Pool	Not Applicable
Spillway Crest	Not Available

g. Dam -

Type:	Concrete gravity dam
Length:	900 feet
Height:	75 feet
Top Width:	9 feet
Side Slopes:	Upstream: Vertical
	Downstream: 7 Horizontal/10 Vertical
Zoning:	Not Applicable
Impervious Core:	Not Applicable
Grout Curtain:	Not Applicable

h. Diversion and Regulating Tunnel -

Type:	No Tunnel
Length:	Not Applicable
Diameter:	Not Applicable
Access:	Not Applicable
Regulation:	Not Applicable

i. Spillway -

Type:	Ogee
Length of Weir:	200 feet
Crest Elevation:	370
Upstream Channel:	Reservoir
Downstream Channel:	Natural stream

Spillway is founded on rock (plans)

j. Regulating Outlets -

Intake Structure: 4 30-inch diameter sluice gates, with 24-inch diameter cast iron outlet pipe to water supply main. A 24-inch diameter blow off pipe regulated by a 12-inch cone valve.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN:

The design of the dam was made by Buck, Seifert and Jost of New York. Pertinent sections of the following have been utilized in this report.

a. Norwalk Lake Dam (now John D. Milne Dam), contract documents.

b. Norwalk Lake Dam, stress diagrams.

c. Hydraulic design calculations.

While no as-built drawings exist for this project, contract drawings were utilized for evaluation purposes. The basis of design is summarized as follows:

Weight of concrete at 135 pounds per cubic foot.

Silt from elevation 320 at 90 pounds per cubic foot.

Maximum sliding factor 0.75.

Ice pressure 8,000 pounds applied at elevation 369.

Tailwater elevation for flood conditions elevation 300.

Uplift 50% of headwater to 50% tailwater over full area.

2.2 CONSTRUCTION:

Construction specifications and some records are available at the offices of Buck, Seifert and Jost and the First District Water Company in Norwalk, Connecticut and a formal review of these records has been made. The excavations were to have been made to sufficient depth to secure foundation on sound ledge rock, free from weathered material, open seams or other objectionable defects. The excavation for the base of the dam was to be shaped and roughly stepped where necessary to produce the desired surface of contact between the concrete and the foundation rock. Smooth rock was to be roughened and over-cutting filled with concrete.

The masonry dam was to be Class B concrete composed of cement (American Portland Cement) fine aggregate (washed sand) coarse aggregate (broken stone or gravel) and water so proportioned and mixed to produce a plastic workable mixture. The mix was to be proportioned to have a consistency to produce a slump of from 1 inch to 2.5 inches. The twenty-eight day compressive strength was required to be 3,000 pounds per square inch.

In general, the concrete in the dam was to be placed in monoliths 50 feet long and in lifts 5 feet in height. Concrete was to be placed in alternate monoliths. Metal water stops were to be provided at all vertical and horizontal construction joints. Joint drains were to be provided on all horizontal and vertical joints. Review of applicable correspondence indicates that an alternate method of providing horizontal drains (from that shown on plans) was utilized and described as follows:

> "Eliminate horizontal drains shown to be installed in all horizontal construction joints of dam. Substitute therefore one (1) bevelled keyway, 24 inches wide and 6 inches deep in each horizontal construction joint, located below metal water stops. Vertical drains and rock drains to be constructed as shown on the drawings."

2.3 OPERATION:

No formal operation records are available.

2.4 EVALUATION:

a. Availability. Available data was reviewed by members of the inspection team and office personnel and found to be generally accurate and complete.

b. Adequacy. The data available is adequate for the purposes of a Phase I investigation.

c. Validity. There is no reason to question the validity of the available data.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS:

a. General. The structure appears to be in good condition, except for surface patches of spalled concrete. No structural cracks were observed, nor was any visable evidence of abnormal settlements, heaving, deflections or lateral movements noted. The faces, abutments and toes of the concrete structure were examined and evidence of a downstream spring noted. No undermining of the downstream toe was observed.

b. Dam.

1) Upstream Face - At or above the water line, spalling was evident. At construction joints on the east side of dam, considerable spalling just above the water line was noted. The intake chamber also had surface spalling.

2) Downstream Face - Surface spalling of the dam has occurred on the eastern side of the downstream face. On the western side of the dam there was some spalling noted in monolith 3 and 5. In monolith 4 some efflorescence and spalling was observed. An efflorescent pop-out was noticed 20 feet down from the top at monolith 2 (Station 2+75). After removing the thin layer of the bubble, the concrete beneath, although wet, was found to be sound. This area was again observed several weeks after the initial inspection (June 22, 1978) and was still wet. Above this spot along the entire monolith there was evidence of some previous heavy spalling of surface concrete.

3) Toe - Considerable tree growth and bushes exist in the filled areas at the toe of the dam from approximately Station 2+00 to 2+50 on the west side of the dam and from approximately Station 7+00 to 9+50 on the east side of the dam.

No evidence of seepage or wet areas were found along the toe of the dam from the edge of the spillway, Station 6+50 to the left abutment, Station 11+50. Along the right toe of the dam, no seepage or wet areas were found from the right abutment, Station 1+50 to approximately Station 3+00. At approximately Station 3+25, a wet area exists which is approximately 45 feet wide and 85 long, and drains into the outlet channel adjacent to the spillway structure. Several shallow test pits were excavated in the vicinity of the wet areas to a depth of 30" which revealed a loose deposit of sand and gravel. The test pits immediately filled with water to within a couple inches of

the ground surface. Another test pit was excavated to a depth of 30 inches approximately 50 feet west of the wet area on the right abutment which encountered no water.

The gatekeeper indicated this wet area has existed in its present location since the dam was constructed in 1946. During the summer months, the gatekeeper has observed that the wet area dries up sufficiently so that heavy tractor mounted mowing equipment can be driven over the area without sinking in.

The cover of catch basin, west side of spillway, was removed and the structure examined. The basin was made of concrete with a hinged metal cover and measured approximately 7 feet long by 5 feet wide. The depth to the bottom was approximately 3.6 feet with the water surface approximately 1 foot down from the top edge. A set of boards in the middle appeared to separate two chambers. The water present in the drainage basin appeared very murky with the presence of colloidal organic matter floating in the water. There was no indication of flow present in the catch basin. At the left side of the catch basin, there appeared to be a 10- to 12-inch pipe below the water surface which may flow into the pool downstream of the spillway.

c. Appurtenant Structures. At the water line the intake structure had surface spalling. The concrete inside the chamber was in excellent condition. Sluice gate 2 about 30 feet below water surface was open and in use. The wet well was drained by closing the sluice gate (about 2 hours were required). All four sluice gates were leaking at a low rate into the wet well.

A 24-inch diameter cast iron pipe serves as the outlet conduit. A valve chamber on the downstream side of the dam (Station 7+0) contains a 24-inch diameter double gate valve, manually operated.

Flows are directed either to the supply system at Groupes Reservoir or to a blow off line. The 24-inch blow off line is regulated by a 12-inch diameter cone valve with a deflector device. The blow off was operated, and was found to perform satisfactorily. Two men were required to operate the valve.

d. Reservoir Area. The reservoir perimeter has well vegetated banks at moderate to steep slopes. There was no evidence of slides or sloughing. No noticeable debris or obstructions were seen in the vicinity of the intake tower. A few pieces of brush were noted on the spillway. The depth of sediment, and rate of accumulation in the reservoir is unknown.

e. Downstream Channel. The outlet channel flows in a generally southern direction from the spillway and outlet works. The east bank in the vicinity of the outlet works has been treated with dental concrete to reduce the erosion of the bank due to flowing water. Some deterioration of the concrete has occurred.

The channel is generally in good condition, and resembles a natural river in overall appearance. The channel is bordered on the west by an open field, and on the east by a wooded slope. The channel is formed in earth with a bed consisting of coarse gravel and cobbles, up to 12 inches in diameter, which appears to have been "armored" by the erosion of fine material. It is presently stable.

The channel is strewn with boulders. Heavy tree and brush growth, both within and on the banks of the channel can, in the future, result in additional branches falling into the channel.

3.2 EVALUATION:

Visual observation revealed that the dam and attendant structures are structurally sound and that no immediate actions to remedy any serious problems should be taken.

a. Concrete. The condition of the concrete dam is, in general, good. The deterioration of the upstream face is thought to be the result of wave action and ice action at the construction joints. Observed from a boat, these areas appeared to be the result of lake ice forming in the bevelled grooves of the joints, and mechanically breaking out the concrete during shifting of the ice mass. It is suspected that these areas of damage are confined to the range of water line elevations, characteristic of winter. The base concrete of the downstream face appears to be sound and or high quality concrete. The spalling appears to be the result of freeze-thaw deterioration. The source of water is unknown, however, it is possible that it has originated at the upstream face.

It was reported that the spalling of the dam has been repaired by removing all loose and unsound concrete materials and repaired with mortar (#411A as manufactured by Master Builders, Division of Martin Marietta Corp.). Current First District Water Company plans call for similar mortaring of the downstream face (summer, 1978) and the scaffolding is now in place. The upstream face is to also be repaired, however, repairs will probably take place when the pool elevation has receded to an elevation at least 2 feet below the damaged areas.

b. Wet Area. On June 22, 1978, the gatekeeper, Richard Watson, indicated the wet area on the right side of the spillway had dried up sufficiently the previous week to allow heavy tractor-mounted mowing equipment to travel over the area without sinking in. At the time of the second site visit (June 22, 1978), the area was again wet with only a small trickle of water flowing toward the downstream pool. The elevation of the upstream pool had not changed more than a couple of inches since the original site visit on June 1, 1978. The fact that the area dries up at various times during the summer suggests the source of the seepage is from groundwater flow seeping out of the west abutment. Although this wet area is not considered to have an adverse effect on the structural integrity of the dam at this time, it should be closely monitored for cloudiness or any increase or decrease in quantity related to reservoir stage which could require prompt corrective measures. Additionally, the trees and bushes growing at the downstream toe of the dam obscure visual observation of possible sources of seepage. A distance of five to ten feet back from the downstream face of the dam,if maintained free of trees and bushes, would ease periodic inspections.

c. Spillway Channel. The bottom of the spillway channel contains small trees and low lying bushes which can reduce its flow capacity.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES:

The dam blow off is operated to maintain minimum flow of the Silvermine River. The distribution system supplies water to Grupes Reservoir and the New Canaan pump station. Take off points from the reservoir are changed periodically.

4.2 MAINTENANCE OF DAM:

The dam and associated structures are well maintained with a regular program of grass mowing and general maintenance in effect. A concrete inspection performed by a consultant to the First District Water Company resulted in recommended repairs. These repairs have been partially implemented and repairs of the downstream face are reportedly scheduled for July 1978.

Maintenance of the drainage features of the dam has not received adequate attention. The catch basin which outlets drainage from the west side of the dam had not been opened in many years. The catch basin (similar function) for east side of the dam (if constructed) is covered at this time and could not be located.

4.3 MAINTENANCE OF OPERATING FACILITIES:

The regulating gates and valves were tested and appear to be in mechanically good operating condition. The sluice gates do not seat completely and slight leaks were noted, however, this is not considered to effect the safety of the dam.

4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT:

There was no warning system of any kind in effect at the time of the inspection.

4.5 EVALUATION:

A permanent, regular operation and maintenance program of the operating valves and drainage facilities, if initiated and carried out by trained personnel, would decrease operational difficulties.

The owner should develop a formal warning system. An operational procedure to follow in the event of an emergency should also be adopted. Although not designed for rapid drawdown, it should be noted that, if the need should arise, drawdown could be affected by allowing for maximum discharge through the 24-inch blow off line and directing water to Grupes Reservoir in the 24-inch supply main.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES:

a. Design Data. The original hydrologic data developed for this dam indicates that the peak flow rates were estimated using four different methods, for the following four average return frequencies:

Projected Peak Flow Rates (CFS)

Source	Average Flood Flow Return Frequency 15 Yr.	100 Yr.	1,000 Yr.	Maximum Flood
Regional Flood Flow Formula	870	1,890	3,340	14,210
House Document No. 455, 75th Congress	1,250	2,300	---	---
Engineer's Data	660	1,630	3,640	---
Unit Hydrograph	1,730	3,050	4,670	9,500
Average	1,130	2,220	3,920	11,880

The design indicated that the maximum recorded rainfall (48-hour duration) in New England up to that time was 14.6 inches, equivalent to a peak flow of 6,900 CFS. The maximum probable rainfall (48-hour duration) was estimated to be 18 inches, and would result in a peak runoff rate of 8,000 CFS. The spillway was designed for a peak flow rate of 8,000 CFS, with 3 feet of freeboard. The spillway was to have an "Ogee" profile, with a dicharge coefficient of 3.9. The spillway stage discharge data calculated by the designer is shown below:

Water Surface Elevation (Ft. MSL)	Total Spillway Discharge For 200' (CFS)	
370	0	
371	780	
372	2,200	
373	4,040	
374	6,240	
375	7,960	(3' freeboard)
376	11,460	(2' freeboard)
377	14,220	(1' freeboard)
378	17,260	(0' freeboard)

b. Experience Data. From conversations with the gatekeeper, no more than about a 1-foot head on the spillway weir (flashboards in place) has been noted (period of record is 8 years). The John D. Milne Dam has been operational since the mid-1940's. During this time, it has safely discharged the floods which have hit the Westchester-Connecticut area.

c. Visual Observations. The on-site inspection of the dam revealed no deviation from the design plans which would alter the hydraulic/hydrologic evaluation of the spillway outlet works. It should be noted, however, that the crest of the spillway has provisions for flashboards up to 2 feet high. Twelve-inch high by three-inch thick flashboards are in current use (June 22, 1978).

d. Overtopping Potential. Actual storm events have not been of sufficient magnitude and duration to approach overtopping of the dam. The John D. Milne Dam was designed to discharge a flow of 8,000 CFS with 3 feet of freeboard, and 17,620 CFS with no freeboard. The flow rates above, which were projected in 1944 by the designer, can be readily compared to currently available regional flood flow data. Under established criteria (OCE guidelines), the recommended spillway test flood for the size (intermediate) and hazard potential (high) classification is the probable maximum flood (PMF). The PMF is the flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region. The test flood estimated for this evaluation is 15,700 CFS. The effect of Brown's Reservoir in reducing flood peaks was considered to be negligible. Comparing design calculations for spillway discharge indicates that the test flood would result in a maximum elevation of 377.2±, or 0.8 feet below the top of the dam (see Appendix II). The dam would not be overtopped during the test flood.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY:

a. Visual Observations. Visual observations did not indicate any existing structural problems. The condition of the concrete surfaces were generally good. Some spalling of concrete surfaces on the upstream, downstream and overflow sections was observed. However, the underlying concrete appears to be of good quality and is sound. No structural cracking was observed. No evidence of abnormal settlements, heaving, deflections, or lateral movement were observed. The junction of the dam with the core wall showed no signs of differential settlement. The spillway section showed very minor erosion. Since water was flowing during the inspection, any leakage through the spillway section would be undetected. The monolith construction joints were examined and no movement of joints, or indication of distress or leakage noted. No undermining of the downstream toe was observed. The drainage features of the dam could not be inspected since murky water was in the catch basin. There was no indication of positive flow in the basin or that the drains within the dam were performing their design function. A seepage area was noted downstream of the dam, and should be monitored in accordance with recommendations outlined in Section 7.

b. Design and Construction Data. The dam consists of mass concrete founded on bedrock. The stress diagrams developed by the engineer analyzed both the non-overflow dam and overflow dam for the reservoir empty condition, reservoir at flow elevation 375 MSL and reservoir at crest elevation 370 plus ice force and showed each section to be adequately designed. In general, the design assumptions are reasonable. The ice pressure of 8,000 pounds is conservative; 5,000 pounds ice pressure is recommended in Guidelines for Safety Inspection of Dams. The assumption of using 50% headwater to 50% of tailwater over full area is considered reasonable for a dam of this height because the design included provisions for vertical and horizontal drains the full length of the dam. It is not known whether these drains are operable at this time. The construction was based on detailed plans and specifications. The work was reviewed by the design engineer (April 14, 1948) who found"...the dam structure was completed in a satisfactory manner within the time requirements."

c. Operating Records. Formal operating records are not maintained. As the John D. Milne Dam was designed and constructed as a water supply dam and has been subjected to a full head of water almost continuously since its construction, its stability is considered to be adequate based on performance.

d. Post-Construction Changes. A new water supply line to the New Canaan pump station was recently constructed. A basin collecting water from the dam's internal drain system on the east side of the dam (assumed to have been constructed) has since been covered and could not be located.

e. Seismic Stability. This dam is located in Seismic Zone 1, therefore a seismic analysis is not warranted.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 DAM ASSESSMENT:

a. Condition. Based on the visual inspection of the site, review of available information and past performance of the dam, the dam is judged to be in good condition.

The overtopping potential analysis shows that the dam will not be overtopped by the test flood.

b. Adequacy of Information. The information and data available were adequate for performance of this investigation.

c. Urgency. The recommendations and remedial measures should be implemented by the owner over the long term.

d. Need for Additional Investigation. Additional investigations to further assess the adequacy of the dam and appurtenant structures do not appear necessary.

7.2 RECOMMENDATIONS:

It is recommended that the following measures be undertaken by the owner:

1) Finish preparing and patching deteriorated concrete surfaces on upstream face, principally at construction joints and the downstream sloping face.

2) Establish a monitoring program to analyze the quantity and quality of seepage flowing from the wet area near the toe on the west side of the dam near the spillway.

3) The catch basin/drain gallery (west side of dam) should be dewatered to determine whether the drainage system for this side of dam is functioning.

4) The bottom of the outlet channel should be cleaned of branches and bushes, and the trees within the watercourse should be removed.

5) Trees and brush should be removed within a distance of 5 to 10 feet from the toe of the dam to facilitiate inspection.

6) The dental concrete slope protection adjacent to the blow off discharge should be resurfaced.

7.3 REMEDIAL MEASURES:

Although the dam is generally maintained in good condition, it is considered important that the following items be accomplished:

a. Alternatives. Not applicable.

b. Operation and Maintenance and Procedures.

1) Operation and maintenance manual for the project should be prepared.

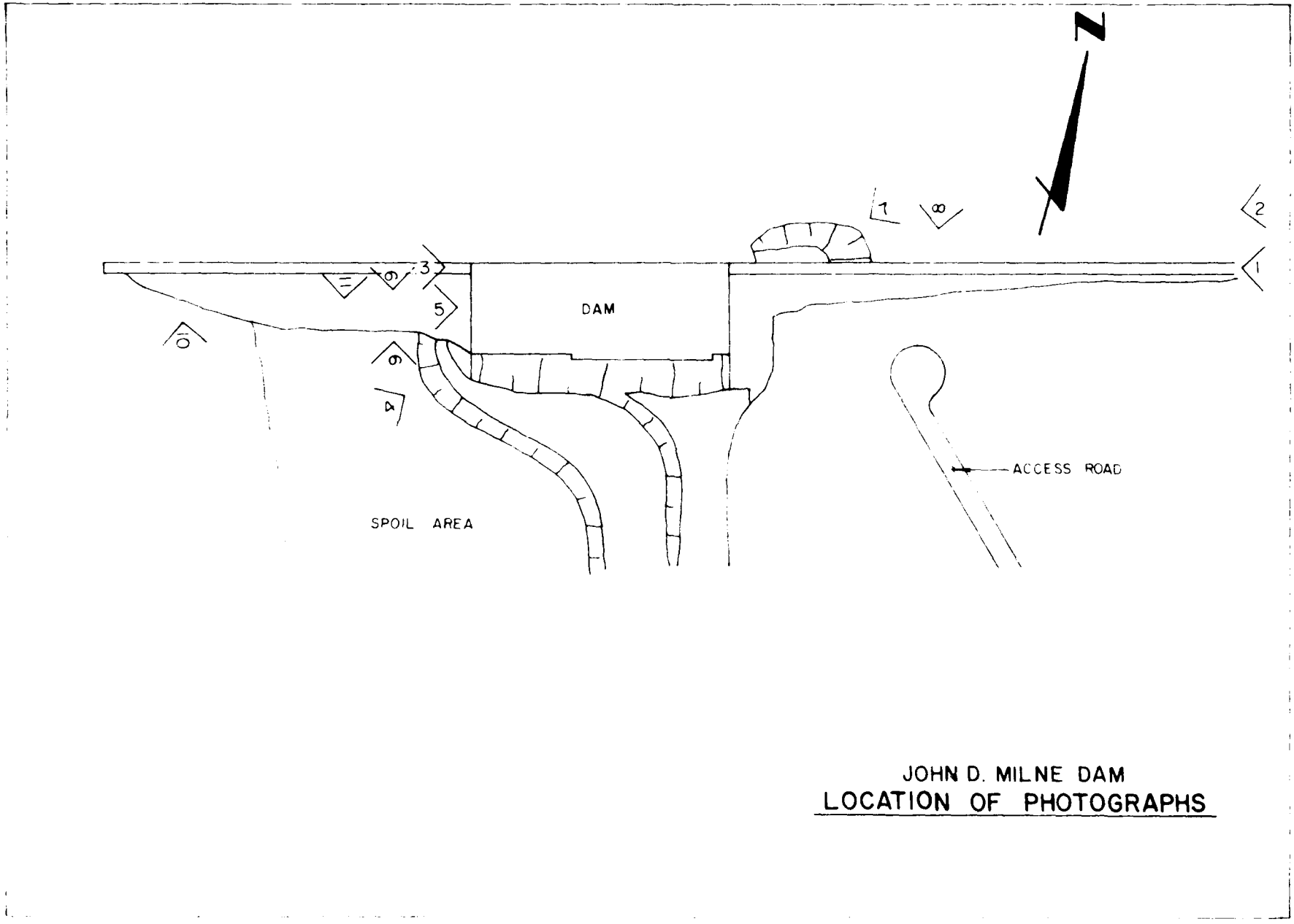
2) A program of periodic inspections of the project features should be established.

3) During periods of unusually high precipitation, round the clock surveillance should be provided.

4) The owner should develop a formal warning system. An operational procedure to follow in the event of an emergency should also be adopted.

APPENDIX I

PHOTOGRAPHS



JOHN D. MILNE DAM

LOCATION OF PHOTOGRAPHS

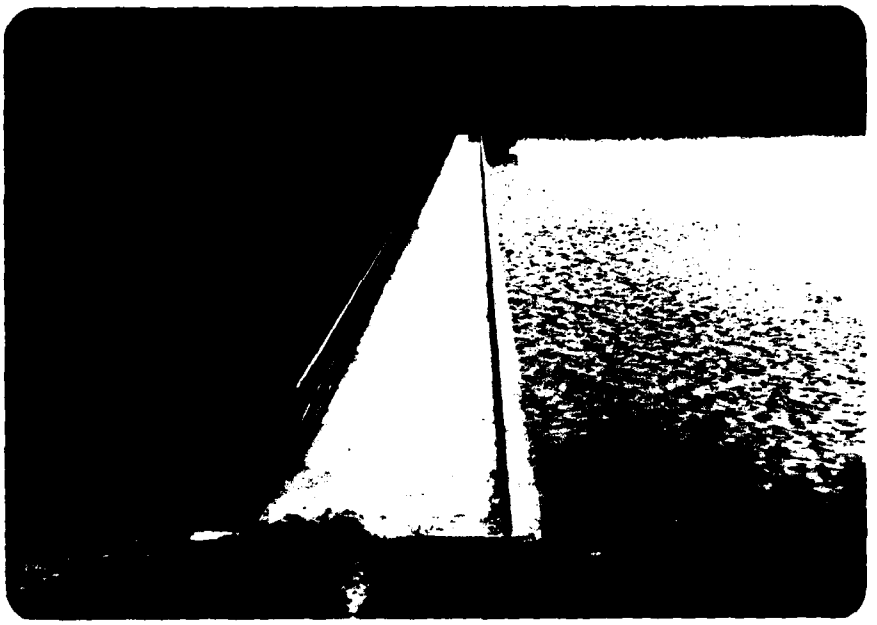


PHOTO #1: Crest of Dam looking West.

PHOTO #2: Upstream Face of Dam looking West.

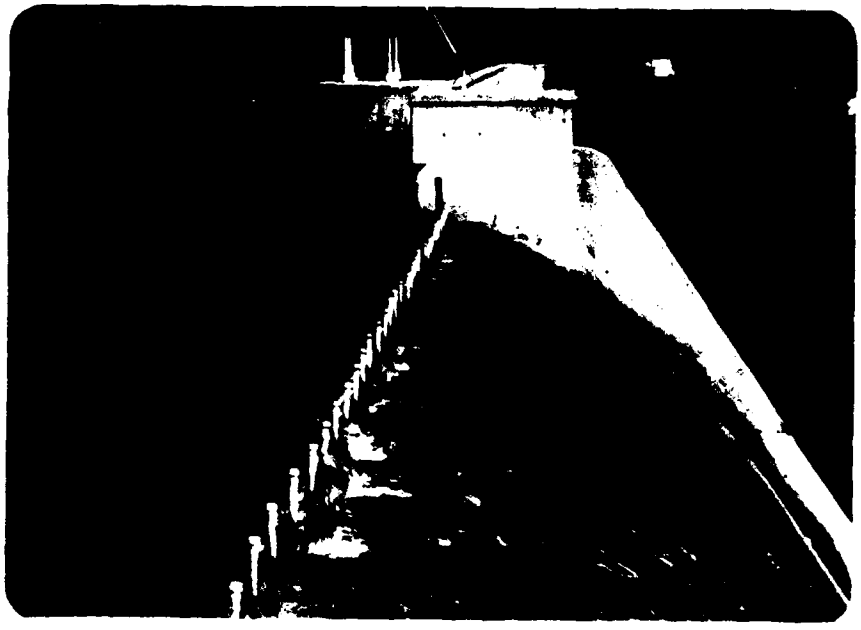


PHOTO #3: Crest of Spillway and Intake Structure looking East. Note Flashboards.

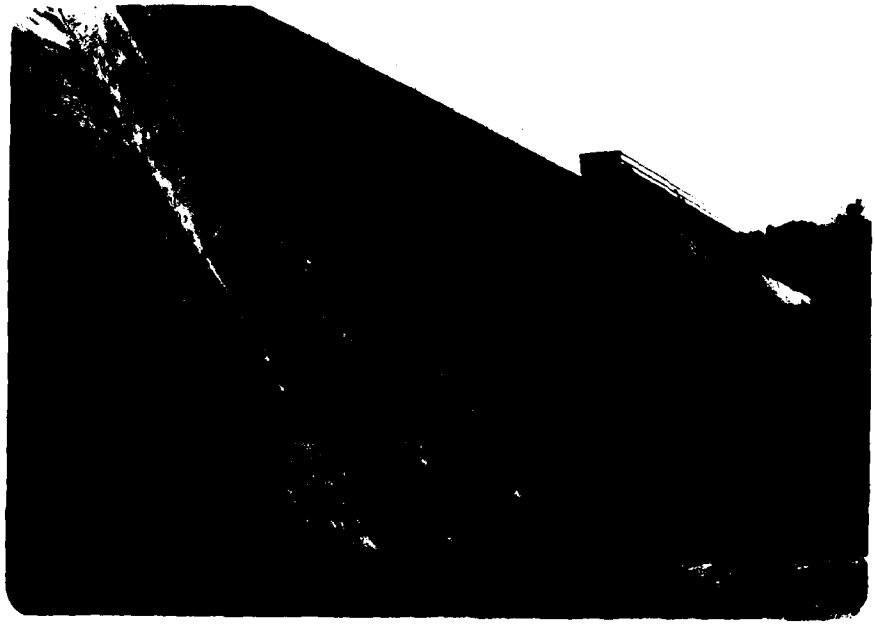


PHOTO #4: Downstream Face of Spillway and Dam looking East.

PHOTO #5: Outlet Works Discharging into Channel.

PHOTO #6: Downstream Channel from Top of Dam.

PHOTO #7: Control Tower.

PHOTO #8: Spalling at a Construction Joint on Upstream Face.

PHOTO #9: Drainage Chamber.

PHOTO #10: Spalling and Efflorescence on Downstream Face (Sta. 1+25).

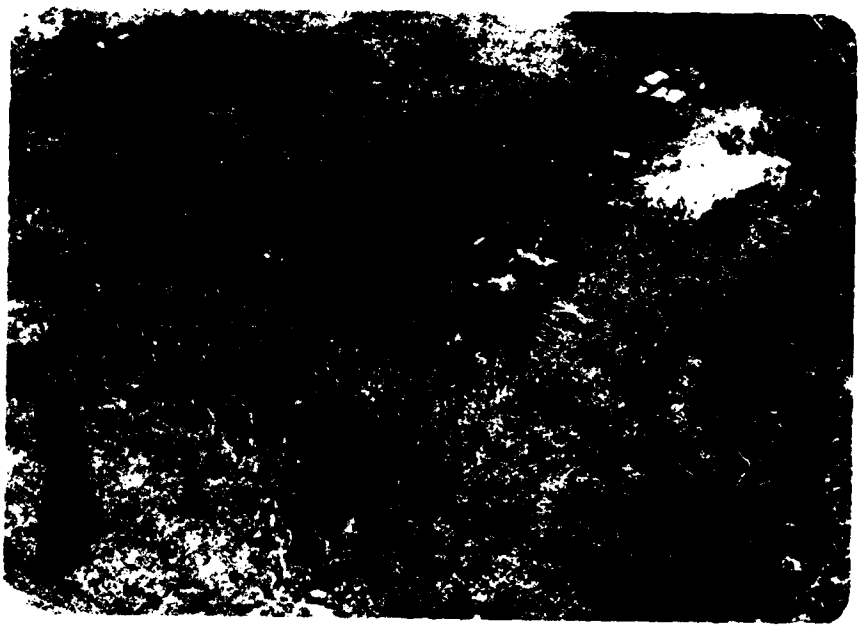
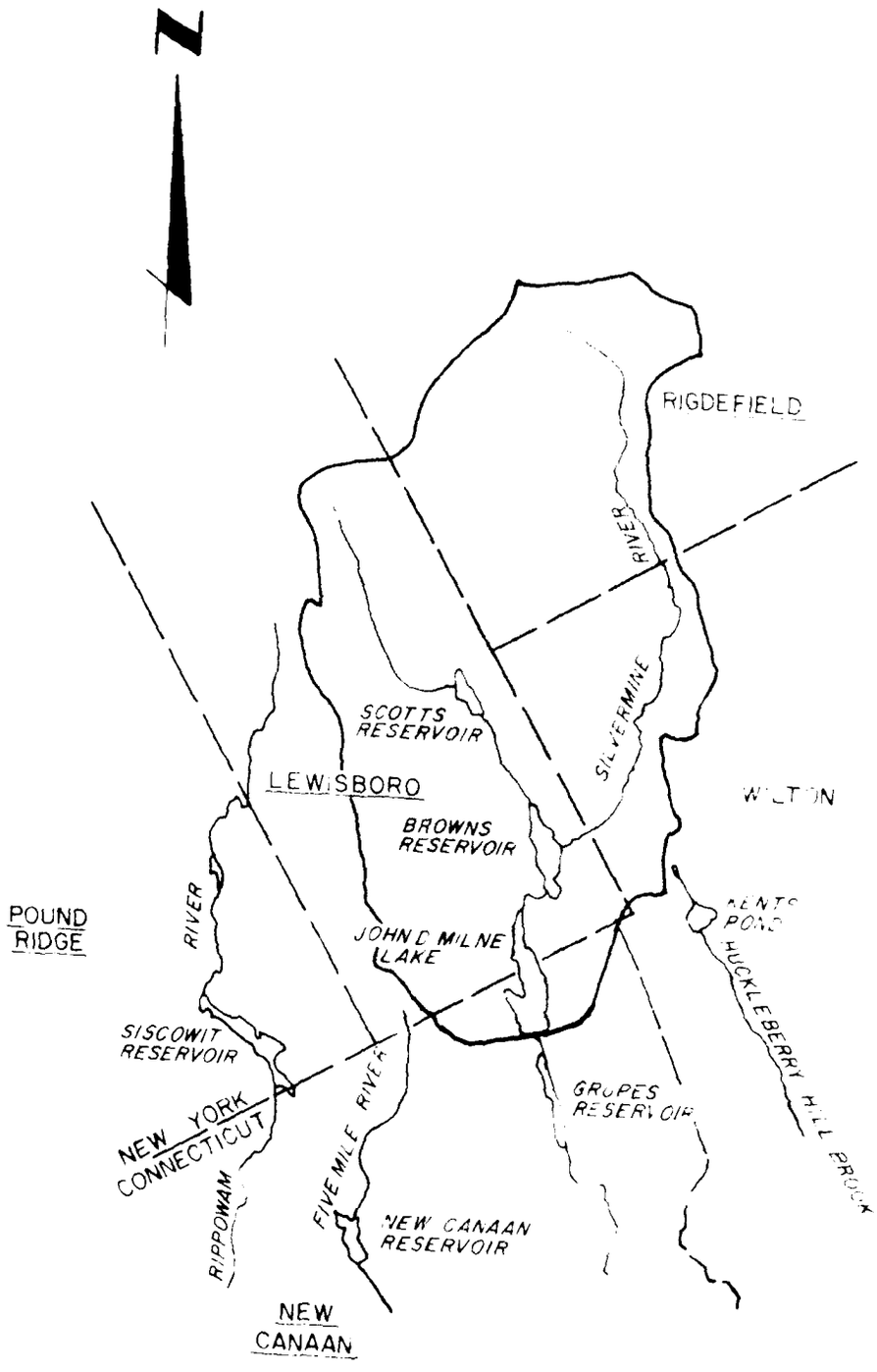


PHOTO #11: Wet Area along Western Toe of Dam.

APPENDIX II

HYDROLOGIC COMPUTATIONS



DRAINAGE AREA MAP

JOHN D. MILNE DAM
NEW CANAAN, CONNECTICUT

RESERVOIR DAM

FUSS & O'NEILL/GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA NEW HAVEN CONN 06510/203/789-1260

SHEET NO. ___ OF ___
BY JGM DATE 2/5/2
CHK'D. BY RLS DATE 2/11/2

P.M.F. PEAK FLOW ESTIMATE

WATERSHED AREA IS 9.5 SQUARE MILES

METHOD #1

REFER TO "PRELIMINARY GUIDANCE FOR ESTIMATING PMF DISCHARGES" BY NEW ENGLAND DIVISION, CORPS OF ENGINEERS

UNIT FLOW = 1650 CFS / SQUARE MILE
PMF ≈ 9.5 MILE^2 × (1650 CFS) = 15,675 CFS

METHOD #2

REFER TO "CONN WATER RESOURCE BULLETIN #17, PART 4", BY U.S.G.S.

MEAN ANNUAL FLOOD = 400 CFS (FIG. 13)
Q_{100} = 5 × MAF = 5(400) = 2000 CFS (FIG. 14)

PMF ≈ 5 × Q_{100} (APPROXIMATE)
PMF ≈ 5 × 2000 CFS = 10,000 CFS

METHOD #3

REFER TO FAIRFIELD, CT. FLOOD INSURANCE STUDY, "FREQUENCY DISCHARGE, DRAINAGE AREA CURVES"

Q_{100} = 2250 CFS (FIG. 2)
PMF ≈ 5 × Q_{100} ≈ 5(2250 CFS) = 11,250 CFS

FOR SPILLWAY EVALUATION, USE 15,700 CFS

RESERVOIR DAM

ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN CONN 06510/203/789-1260

BY JGM DATE 7/5/82
CHK'D. BY RCS DATE 8/1/82

J.G.M. FORMATION OF INFLOW HYDROGRAPH

1) P.M.F. ≈ 15,700 CFS (SEE PREVIOUS SHEET)

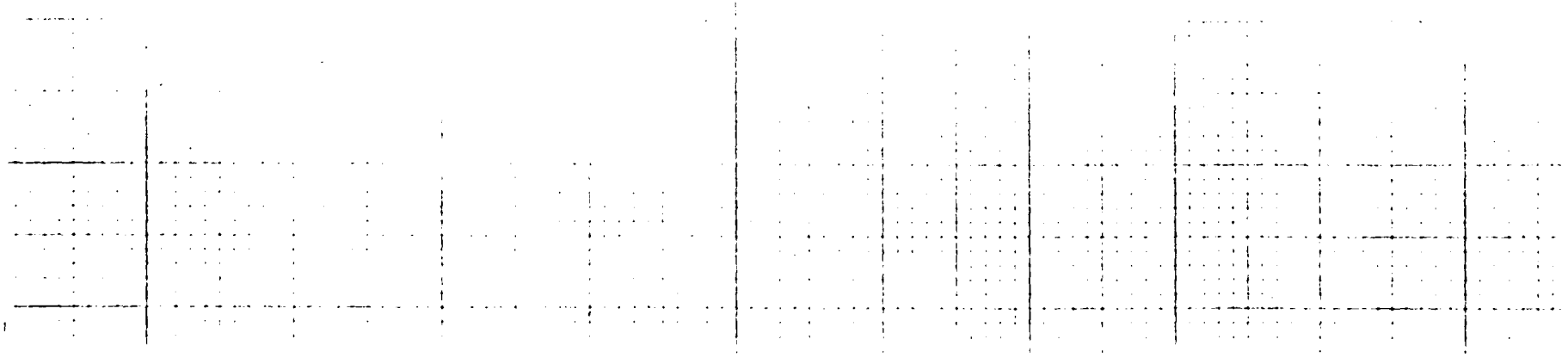
2) FORM A TRIANGULAR HYDROGRAPH
24 HOUR DURATION, PEAK AT 8 HOURS

TIME HOURS	UNIT FLOW RATE	FLOW RATE CFS
0	0.00	0
2	0.25	3925
4	0.50	7850
6	0.75	11,775
8	1.00	15,700
10	0.875	13,738
12	0.75	11,775
16	0.50	7850
20	0.25	3925
24	0.00	0

MILNE DAM 78-36-10 FLOOD ROUTING JGM 7/13/78

INPUT DATA: UNSUBMERGED WEIR
SEGMENT 1 DISCHARGE COEFFICIENT = 3.9 LENGTH OF WEIR = 200 ELEVATION OF WEIR = 370
SEGMENT 2 DISCHARGE COEFFICIENT = 3 LENGTH OF WEIR = 700 ELEVATION OF WEIR = 378
IE=370 IV= 0.0 E=370 A= 69.60 E=380 A= 81.40

HOUR	INFLOW	MASS INFLOW	WATER EL.	TAIL WATER	OUTFLOW	MASS OUTFLOW	STORAGE(R)	STORAGE(A)
0.00	0CFS	0.00AC-F	370.00FT	0.00FT	0CFS	0.00AC-F	0.00AC-F	0.00AC-F
2.00	3,925CFS	324.38AC-F	372.00FT	0.00FT	2,210CFS	182.65AC-F	141.72AC-F	141.72AC-F
4.00	7,850CFS	1,297.52AC-F	374.47FT	0.00FT	7,372CFS	974.59AC-F	322.92AC-F	322.92AC-F
6.00	11,775CFS	2,919.42AC-F	375.83FT	0.00FT	11,000CFS	2,493.03AC-F	426.38AC-F	426.38AC-F
8.00	15,700CFS	5,190.08AC-F	377.23FT	0.00FT	15,169CFS	4,655.88AC-F	534.20AC-F	534.20AC-F
10.00	13,738CFS	7,622.97AC-F	377.01FT	0.00FT	14,477CFS	7,106.06AC-F	516.90AC-F	516.90AC-F
12.00	11,775CFS	9,731.48AC-F	376.13FT	0.00FT	11,854CFS	9,282.24AC-F	449.24AC-F	449.24AC-F
16.00	7,850CFS	12,975.28AC-F	374.86FT	0.00FT	8,357CFS	12,623.07AC-F	352.21AC-F	352.21AC-F
20.00	3,925CFS	14,921.57AC-F	373.08FT	0.00FT	4,217CFS	14,701.57AC-F	219.99AC-F	219.99AC-F
24.00	0CFS	15,570.33AC-F	370.89FT	0.00FT	659CFS	15,507.62AC-F	62.70AC-F	62.70AC-F



APPENDIX III

VISUAL INSPECTION

CHECK LIST

PERIODIC INSPECTION CHECK LIST

PROJECT John D. Milne Dam **DATE** June 1, 1978

INSPECTOR Anthony D. Rummo **DISCIPLINE** Structural

INSPECTOR Robert C. Smith **DISCIPLINE** Project Manager

AREA EVALUATED	CONDITION
CONCRETE DAM STRUCTURE	
General Condition Concrete Surfaces	The condition of concrete is good
Movement or Settlement of Crest	No noticeable movement of dam crest or side slopes. Good horizontal and vertical alignment.
Vertical Alignment	
Horizontal Alignment	
Condition at Abutment and Other Structures	Slight erosion at west abutment adjacent to core wall. Good condition at intake structure
Structural Cracking	None
Spalling	Surface spalling has occurred both U/S and D/S faces
Visible Reinforcing	
Rusting or Staining of Concrete	None
Condition of Monolith/ Construction Joints	Excellent
Drains - Foundation, Joint, Faces	Could not determine whether drains were functioning
Any Seepage or Efflorescence	Seepage/efflorescence noted on west D/S face of dam (particularly Monolith 2)
Foundation Damage, Undermining	None observed
Water Passages	Spillway in good condition; some spalling at joints
Abutments	

PERIODIC INSPECTION CHECK LIST

ROJECT John D. Milne Dam DATE June 1, 1978

INSPECTOR Richard Murdock DISCIPLINE Geotechnical

INSPECTOR _____ DISCIPLINE _____

AREA EVALUATED	CONDITION
DAM EMBANKMENT	
Crest Elevation	370 Ft. MSL
Current Pool Elevation	371 (flashboards in place)
Maximum Impoundment to Date	372
Surface Cracks	
Pavement Condition	
Movement or Settlement of Crest	
Lateral Movement	
Vertical Alignment	
Horizontal Alignment	
Condition at Abutment and at Concrete Structures	
Indications of Movement of Structural Items on Slopes	
Trespassing on Slopes	
Sloughing or Erosion of Slopes or Abutments	
Rock Slope Protection - Riprap Failures	None observed
Unusual Movement or Cracking at or near Toes	None observed
Ususual Embankment or Downstream Seepage	None observed

PERIODIC INSPECTION CHECK LIST

PROJECT John D. Milne Dam DATE June 1, 1978

INSPECTOR Richard Murdock DISCIPLINE Geotechnical

INSPECTOR _____ DISCIPLINE _____

AREA EVALUATED	CONDITION
DAM EMBANKMENT - (continued)	
Piping or Boils	None observed
Foundation Drainage Features	Basin not maintained; no indication of flow present
Toe Drains	
Instrumentation System	

PERIODIC INSPECTION CHECK LIST

PROJECT John D. Milne Dam — DATE June 1, 1978

INSPECTOR Anthony D. Rummo — DISCIPLINE Structural

INSPECTOR James MacBroom — DISCIPLINE Hydraulics/ Hydrology

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	
General Condition	Good
Condition of Joints	Good
Spalling	
Visible Reinforcing	None observed
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	None
Joint Alignment	Good
Unusual Seepage or Leaks in Gate Chamber	None observed
Cracks	None observed
Rusting or Corrosion of Steel	Some corrosion of steel screen slots
b. Mechanical and Electrical	
Air Vents	
Float Wells	
Crane Hoist	Operates, new cable installed 1977
Elevator	None
Hydraulic System	

PERIODIC INSPECTION CHECK LIST

PROJECT John D. Milne Dam — DATE June 1, 1978

INSPECTOR Anthony D. Rummo — DISCIPLINE Structural

INSPECTOR James MacBroom — DISCIPLINE Hydraulics/ Hydrology

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER (continued)	
Service Gates	4 sluice gates operable, leak slightly
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System In Gate Chamber	

PERIODIC INSPECTION CHECK LIST

PROJECT John D. Milne Dam — DATE June 1, 1978

INSPECTOR Anthony Rummo — DISCIPLINE Structural

INSPECTOR James MacBroom — DISCIPLINE Hydraulics/ Hydrology

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	None
b. Intake Structure	
Condition of Concrete	Good condition, slight spalling at water line
Stop Logs and Slots	Good condition

PERIODIC INSPECTION CHECK LIST

PROJECT John D. Milne — DATE June 1, 1978

INSPECTOR Anthony D. Rummo — DISCIPLINE Structural

INSPECTOR James MacBroom — DISCIPLINE Hydraulics/ Hydrology

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	Approach channel is reservoir
General Condition	Excellent, flashboards in place
Loose Rock Overhanging Channel	
Trees Overhanging Channel	Few pieces of wood on flash-boards
Floor of Approach Channel	Good
b. Weir and Training Walls	
General Condition of Concrete	Some spalling, minor erosion
Rust or Staining	Very slight staining
Spalling	Some at joints
Any Visible Reinforcing	None
Any Seepage or Efflorescence	Water passing over spillway; no seepage could be observed; leak in training wall
Drain Holes	
c. Discharge Channel	Open channel below spillway good
General Condition	Majority of bed consists of 3"-12" cobbles
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	Several on east side of channel
Floor of Channel	Good condition
Other Obstructions	Small trees and bushes, bedrock outcrop/boulders at 200' down-stream of dam

PERIODIC INSPECTION CHECK LIST

ROJECT John D. Milne DATE June 1, 1978

INSPECTOR Anthony D. Rummo DISCIPLINE Structural

INSPECTOR _____ DISCIPLINE _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	None
a. Super Structure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Under Side of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutments & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

APPENDIX IV

ENGINEERING DATA

CHECK LIST

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM John D. Milne Dam

I.D. NO. 58

ITEM	REMARKS
AS-BUILT DRAWINGS	None exist
REGIONAL VICINITY MAP	Available from U.S.G.S.
CONSTRUCTION HISTORY	Some information available from Buck, Seifert & Jost
TYPICAL SECTIONS OF DAM	Available from plans
OUTLETS - Plan	From plans
- Details	From plans
- Constraints	Unknown
- Discharge Ratings	Unavailable
RAINFALL/RESERVOIR RECORDS	None
DESIGN REPORTS	None
GEOLOGY REPORTS	None
DESIGN COMPUTATIONS	
HYDROLOGY & HYDRAULICS	Available from Buck, Seifert & Jost
DAM STABILITY	Available from plans
SEEPAGE STUDIES	None
MATERIALS INVESTIGATIONS	
BORINGS RECORDS	Borings on plans
LABORATORY	None
FIELD	None

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

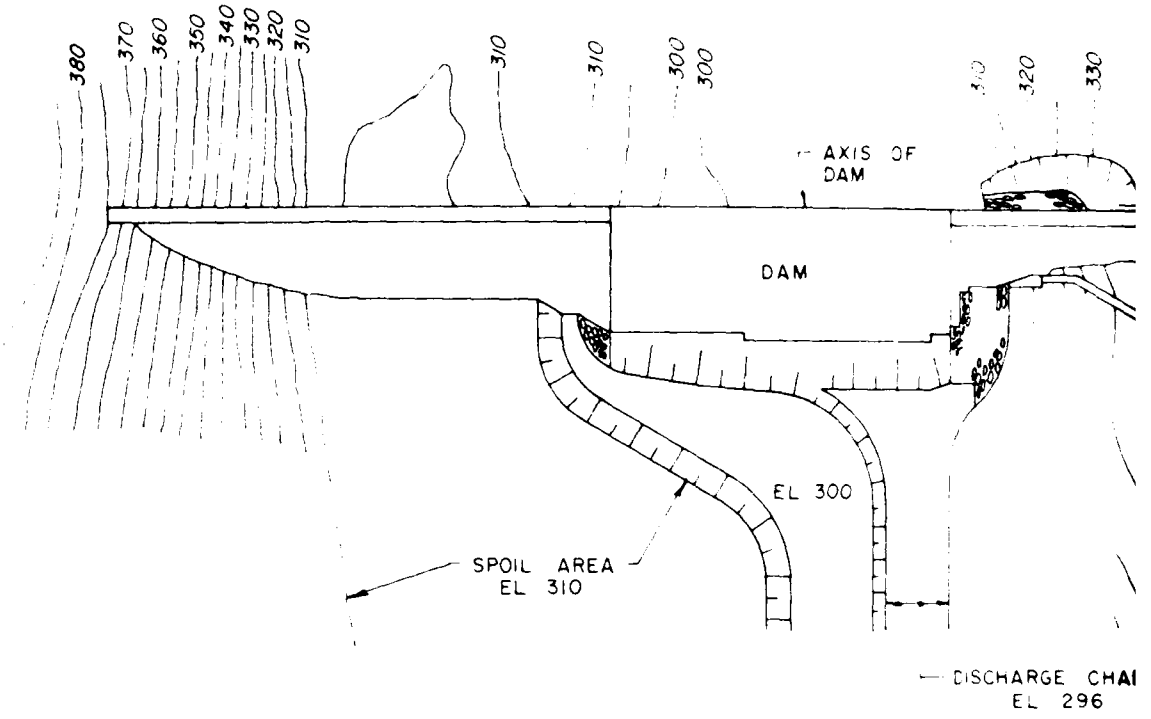
NAME OF DAM Joh J. Milne Dam

I.D. NO. 58

ITEM	REMARKS
POST-CONSTRUCTION SURVEYS OF DAM	None available
BORROW SOURCES	Unknown
MONITORING SYSTEMS	None
MODIFICATIONS	Unknown
HIGH POOL RECORDS	Approximate from First District Water Company
POST-CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None
MAINTENANCE OPERATION RECORDS	None
SPILLWAY PLAN	
SECTIONS	From plans
DETAILS	From plans
OPERATING EQUIPMENT PLANS & DETAILS	From plans

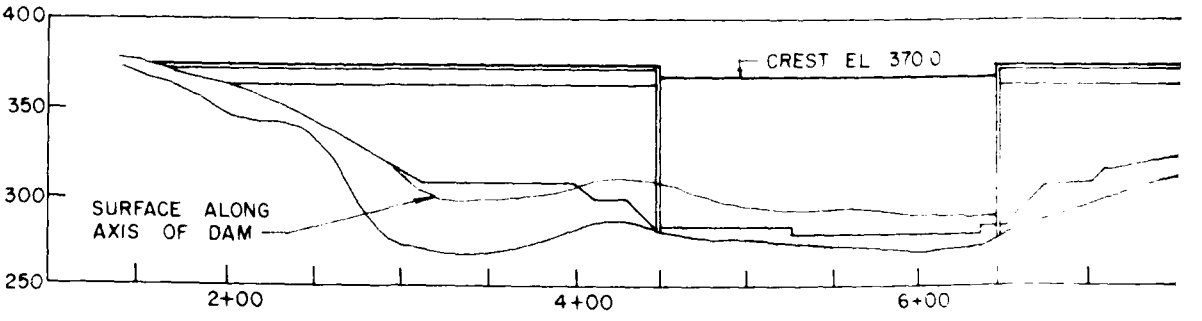
APPENDIX V

DRAWINGS



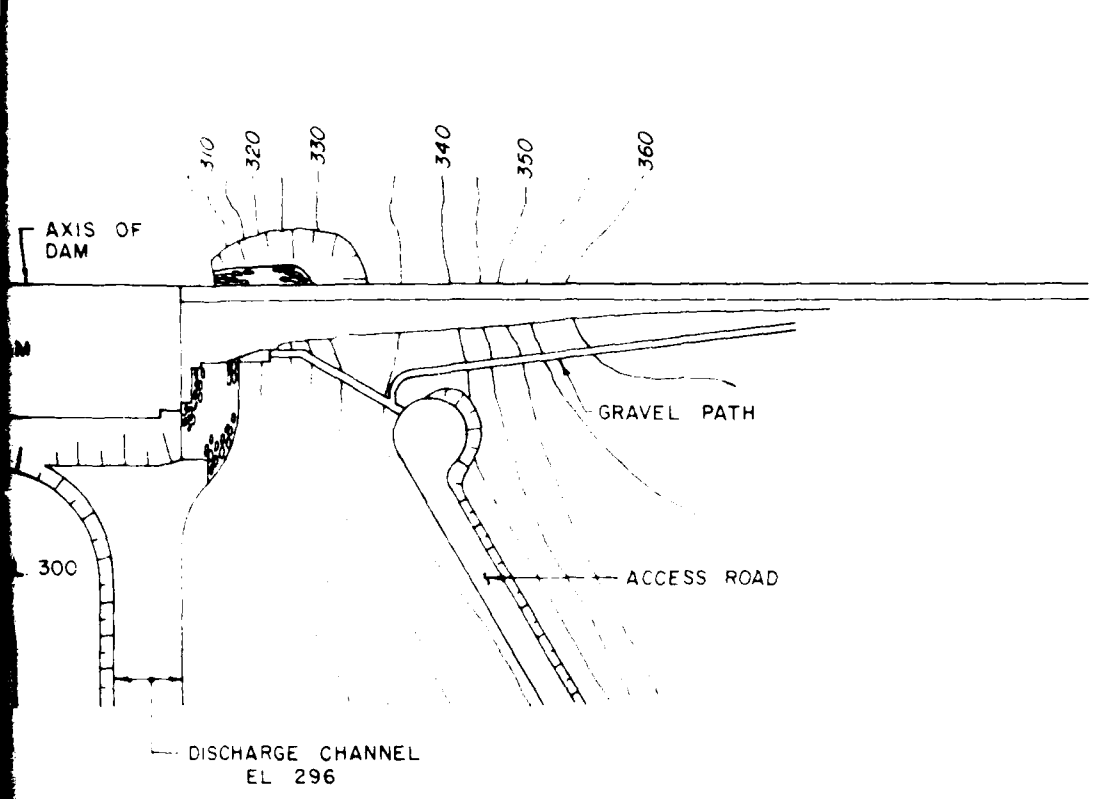
PLAN

NTS



DOWNSTREAM ELEVATION

NTS



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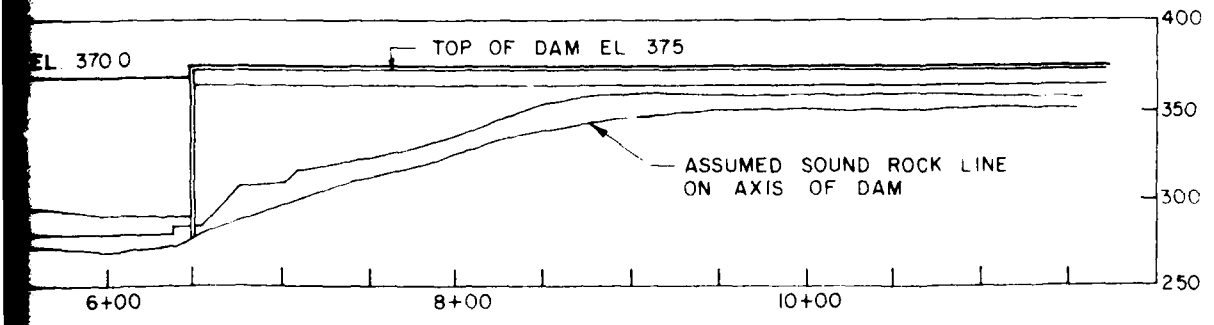
PLAN

NTS

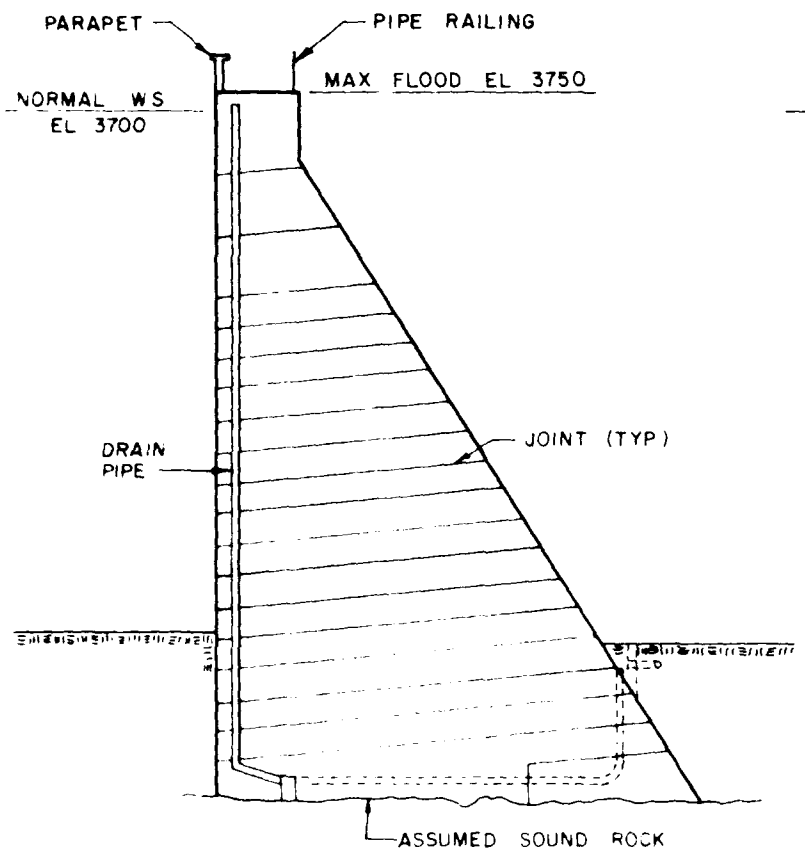


REAM ELEVATION OF DAM

NTS

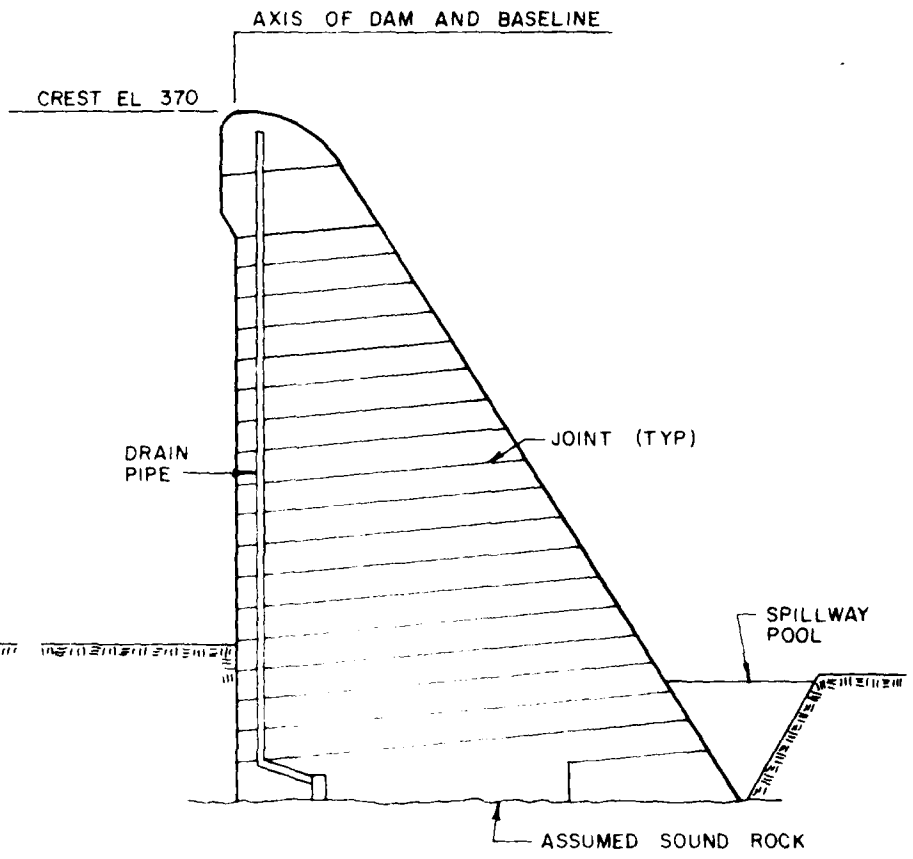
JOHN D. MILNE DAM

SILVERMINE RIVER



TYPICAL NON-OVERFLOW SECTION

NTS

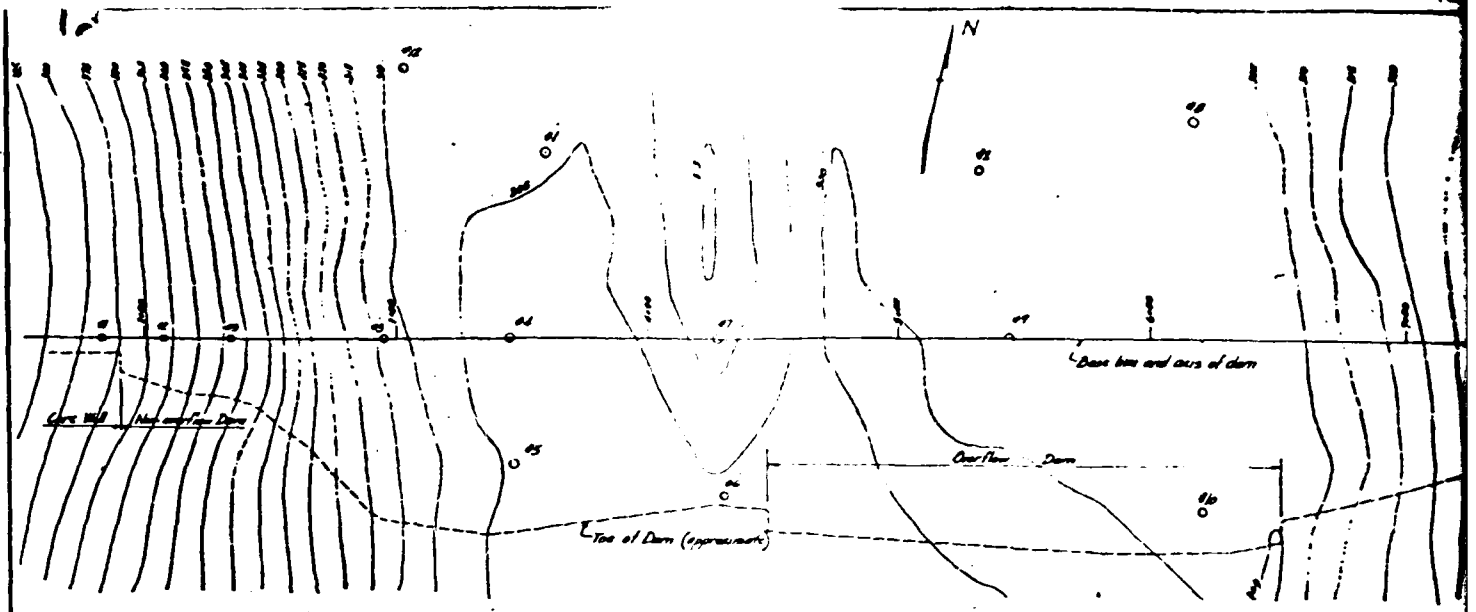


TYPICAL OVERFLOW SECTION

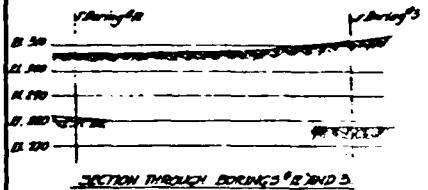
NTS

JOHN D. MILNE DAM

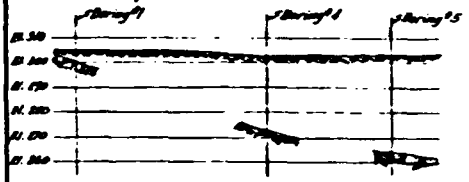
SILVERMINE RIVER



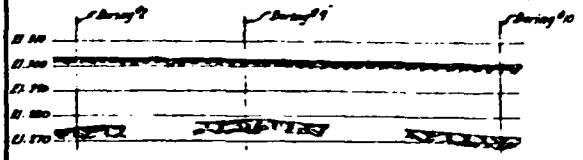
PLAN
Scale : 1"=30'-0"



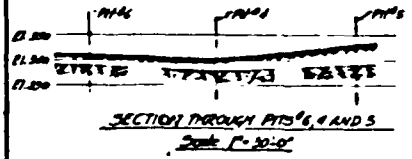
SECTION THROUGH BORINGS #2 AND 3.
Scale : 1"=30'-0"



SECTION THROUGH BORINGS #1, 4 AND 5.
Scale : 1"=30'-0"

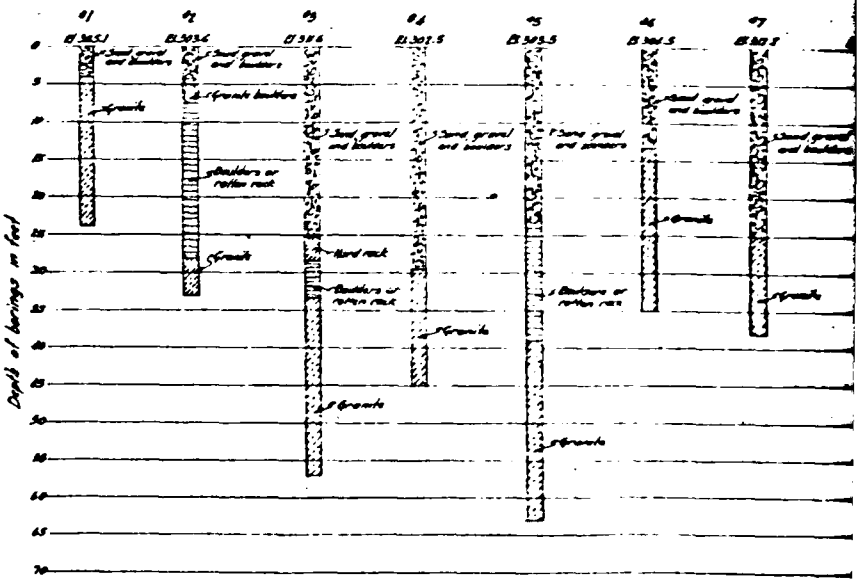


SECTION THROUGH BORINGS #8, 9 AND 10
Scale 1"=30'-0"

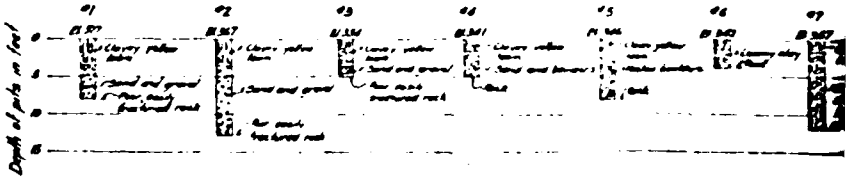


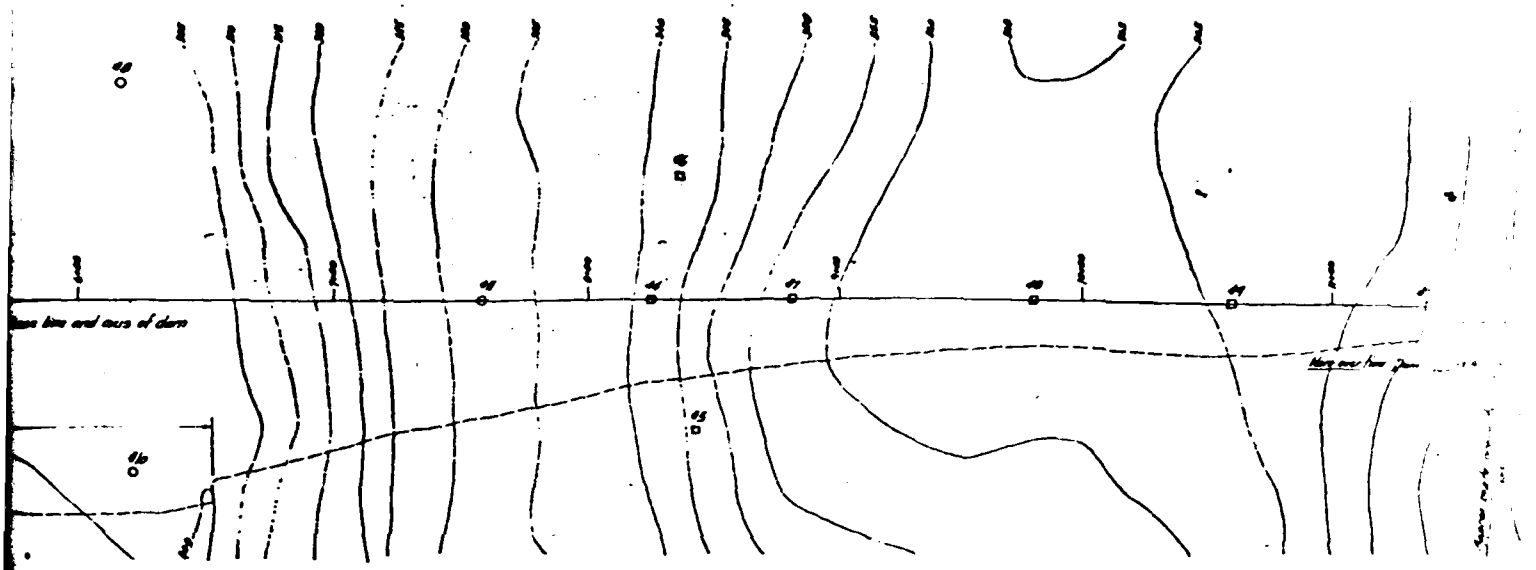
SECTION THROUGH PITS #6, 4 AND 5
Scale 1"=30'-0"

BORINGS
Vertical scale : 1"=10'-0"



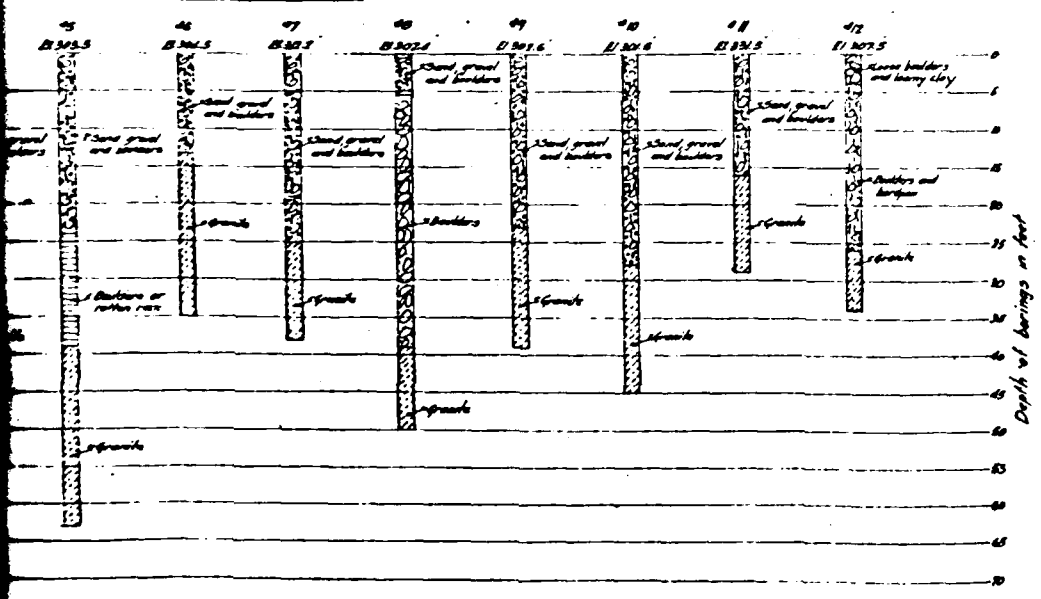
TEST PITS
Vertical scale 1"=10'-0"





PLAN
Scale: 1"=30'-0"

BORINGS
Vertical scale: 1"=10'-0"



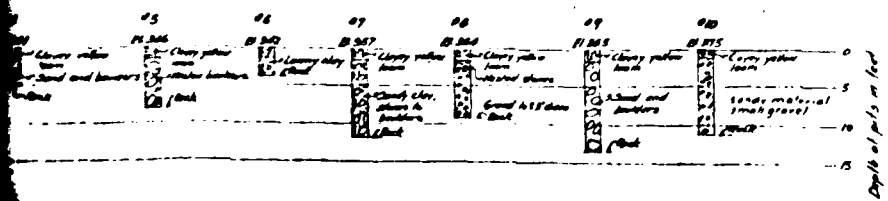
LEGEND APPLYING TO BORINGS AND TEST PITS

CORE BORING
TEST PIT
LOAM
SAND
GRAVEL
BOULDERS
ROCK
BOULDERS OR ROTTEN ROCK
CLAY

NOTES

All classifications of materials from borings taken from drillers log and those from test pits taken from field records
No guarantee is given or implied as to the accuracy of the drill records and they should be used only as a general indication of the character and extent of the materials
Bidders shall examine the boring samples and rock cores which are available for their inspection at the Norwalk Filtration Plant and shall form their own opinion of the character and extent of the materials to be excavated
If required by the engineer after the rock surface is exposed the location of the axis of the dam will be shifted upstream or downstream from the location shown on this drawing
All elevations are referred to Mean Sea Level

TEST PITS
Vertical scale 1"=10'-0"



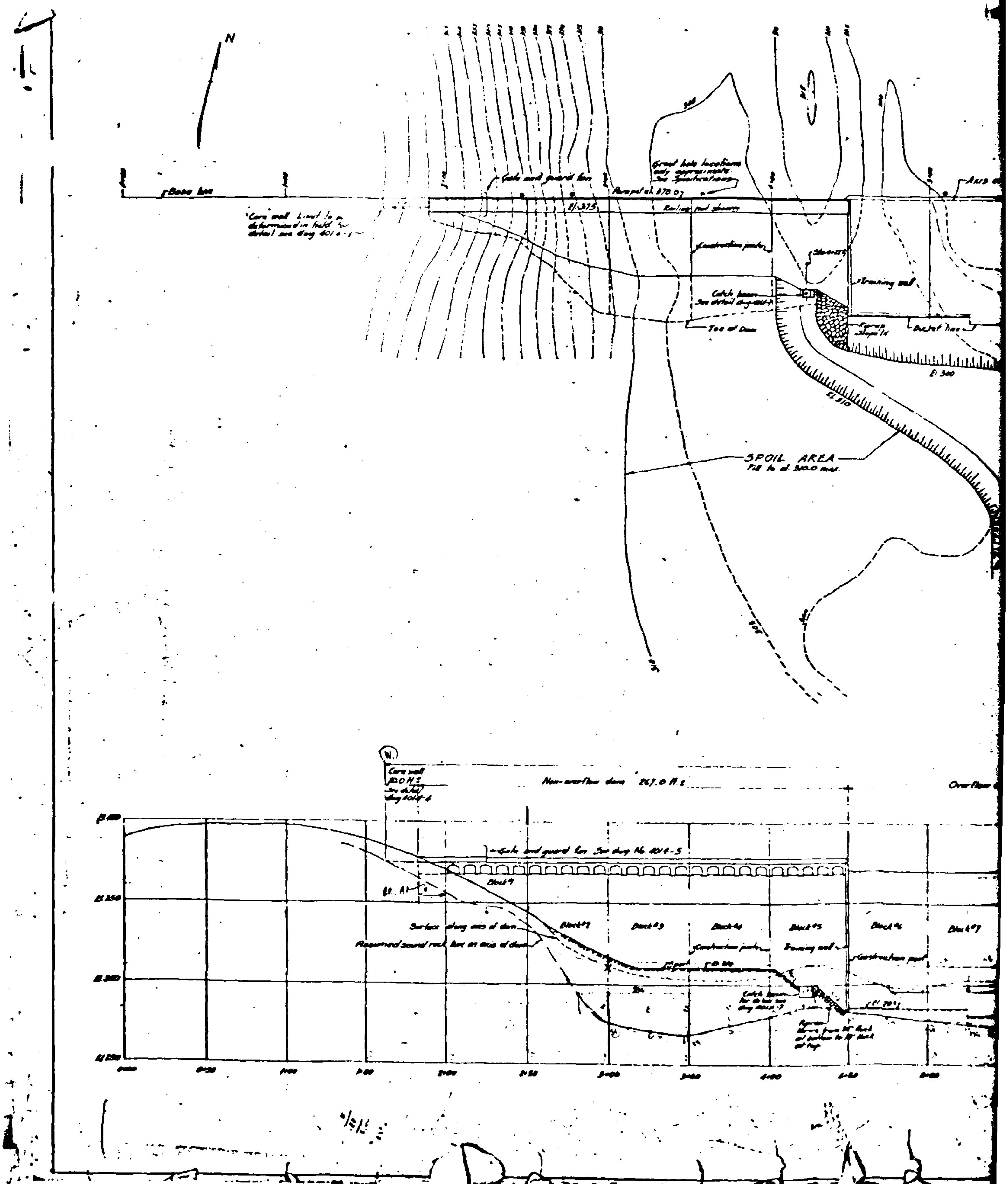
DRAWING NO 401.4-2

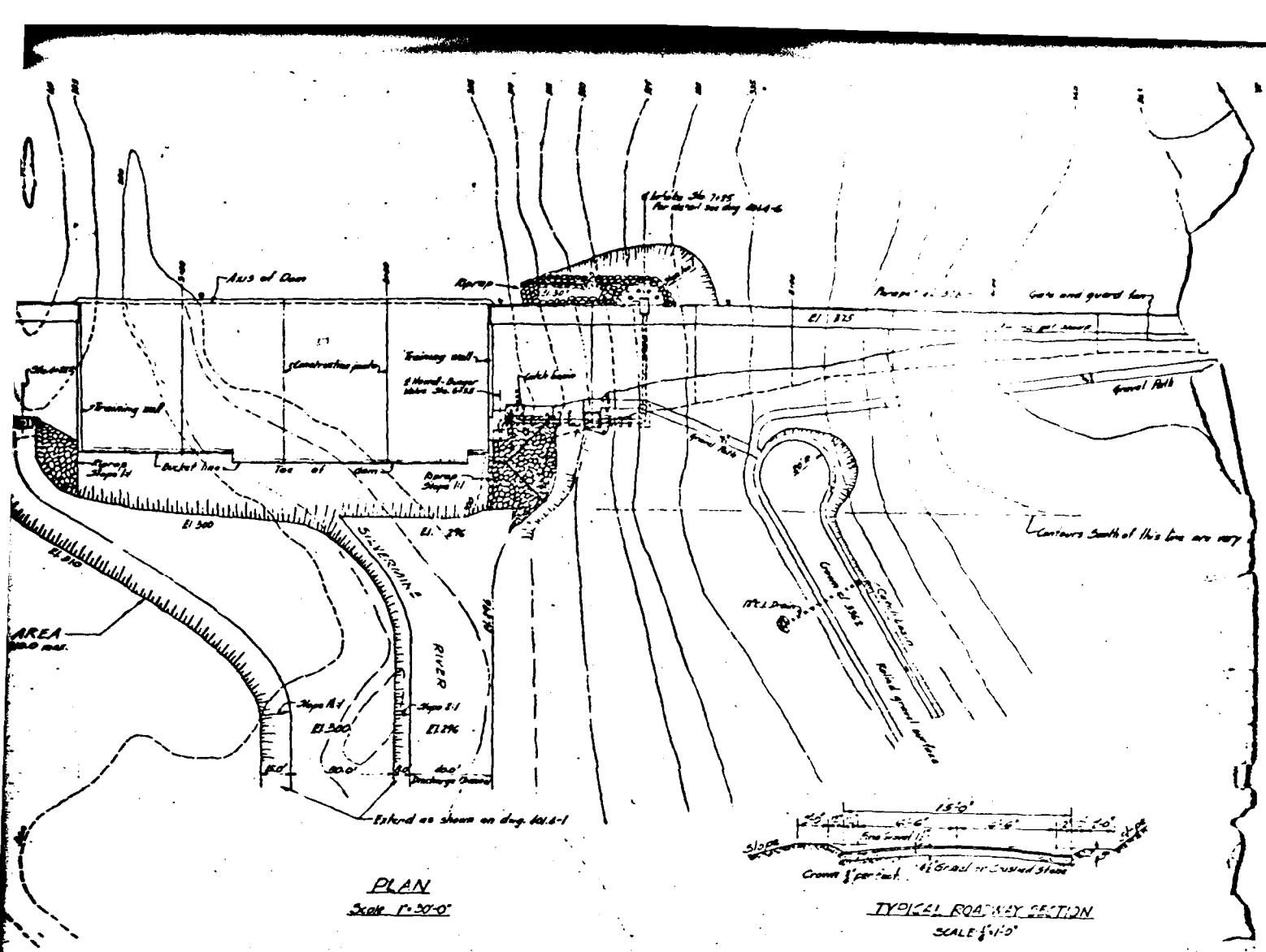
NORWALK, CONNECTICUT
FIRST TAXING DISTRICT
NORWALK LAKE DAM
BORING AND TEST PIT PLAN

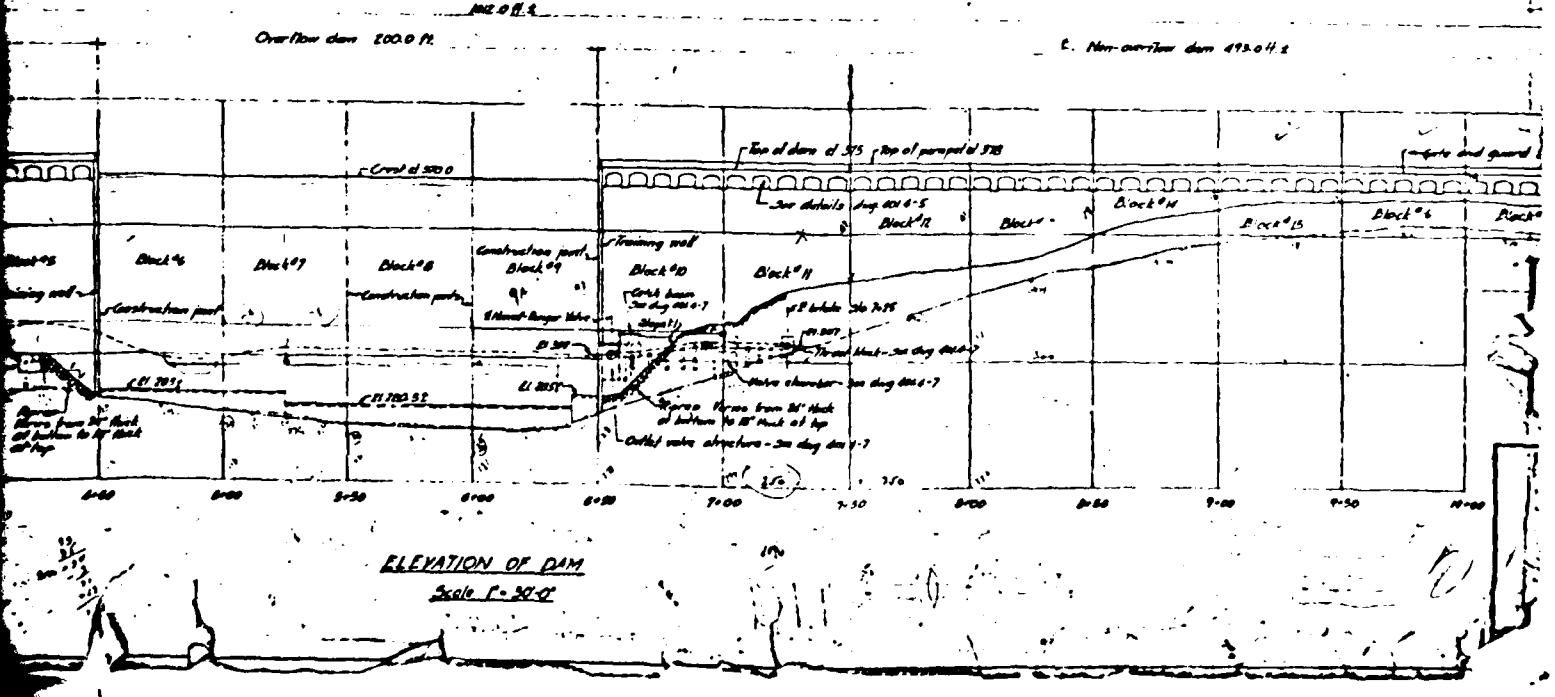
Buck, Seifert & Jost
Consulting Engineers
112 East 19th St
New York City

Scale as shown July, 1963

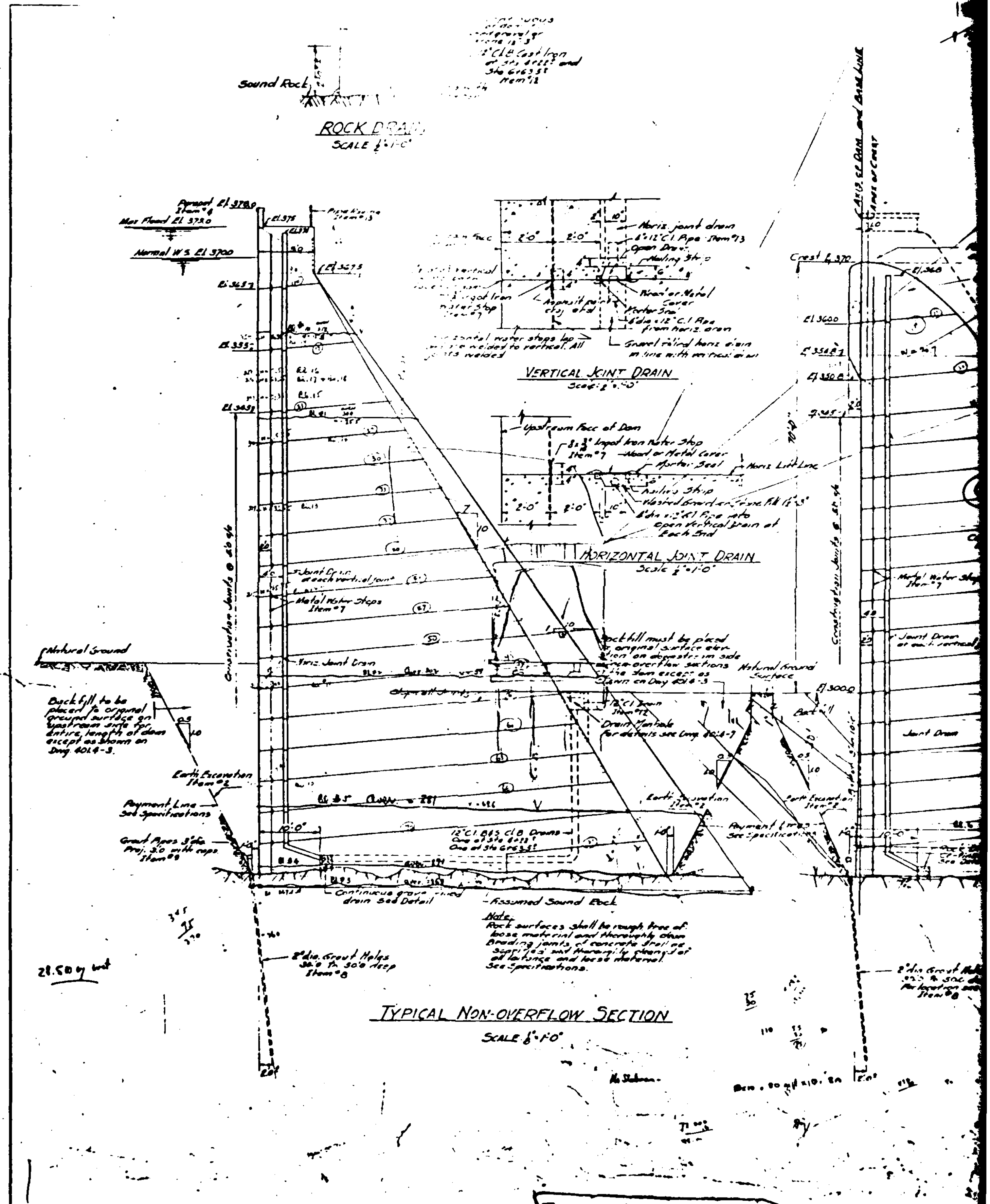
Drawn SBW | Checked | Examined ARF | Approved


N
Base line
Gate and guard line
Parapet el. 378.0
Grout hole locations only approximate. See Specifications
El. 375
Railing not shown
Construction joints
Catch basin
Toe of Dam
Training wall
Bucket line
El 300
El 310
SPOIL AREA
Fill to el. 310.0 max.
Non-overflow dam 267.0 ft ±
Gate and guard line See dwg No. 4014-5
Surface along axis of dam
Assumed sound rock line on axis of dam
Construction joints
Training wall
Construction joint



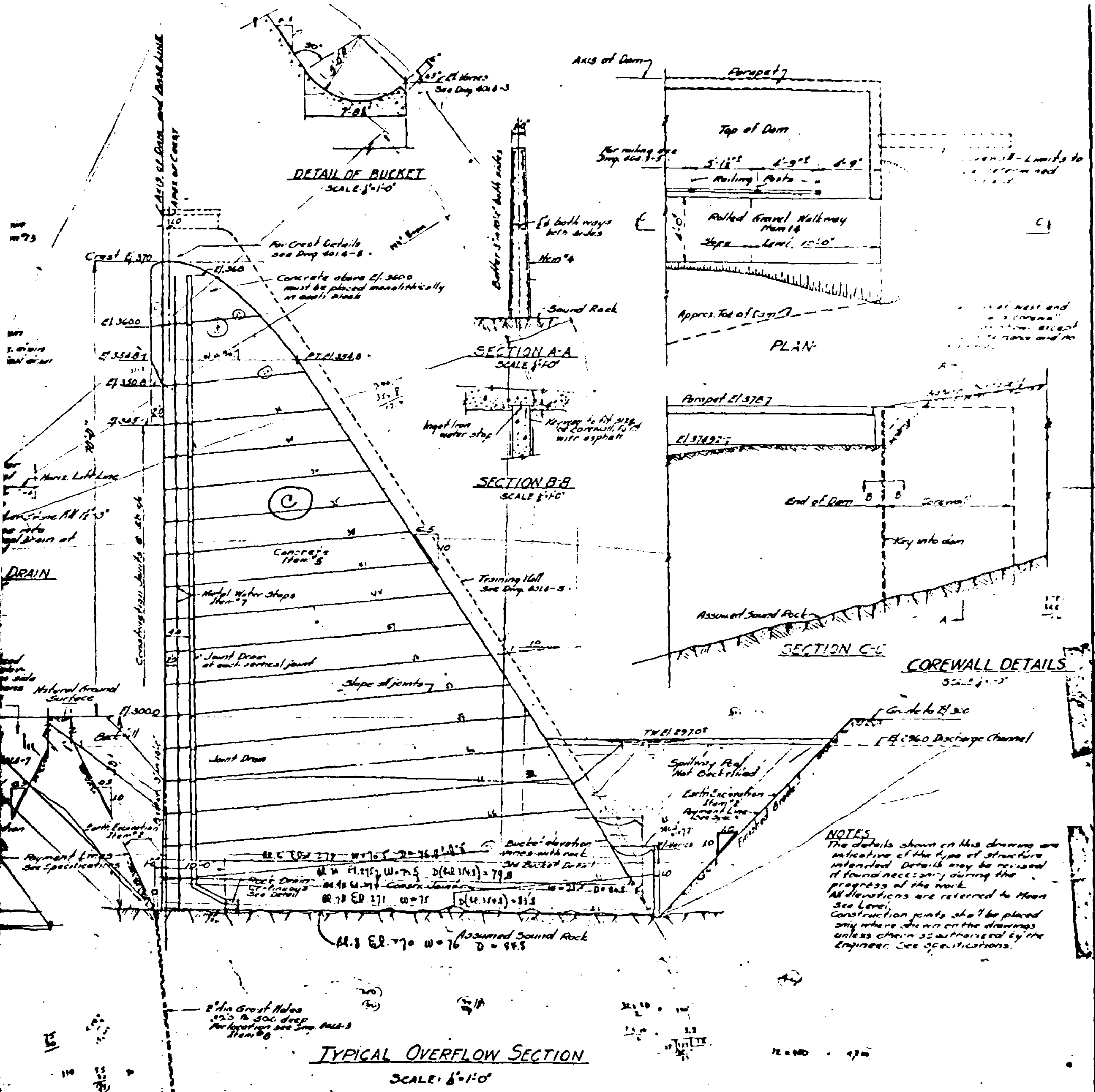


ELEVATION OF DAM
Scale 1"=30'-0"



TYPICAL NON-OVERFLOW SECTION

SCALE 1/8" = 1'-0"



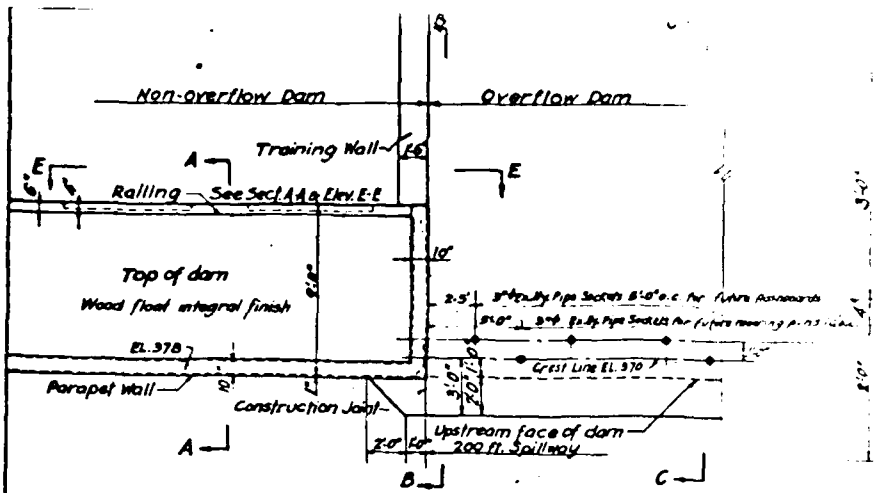
DRAWING NO 40L4-4

NORWALK, CONNECTICUT
FIRST TAXING DISTRICT
NORWALK LAKE DAM
CONSTRUCTION JOINTS, SEALS & GROUTING

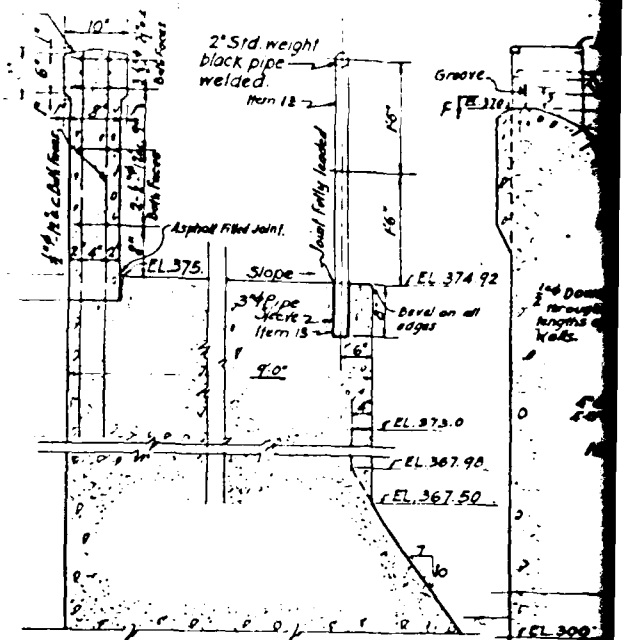
Buck, Seifert & Jost
Consulting Engineers
112 East 19th St
New York City

Scale as shown — July, 1938

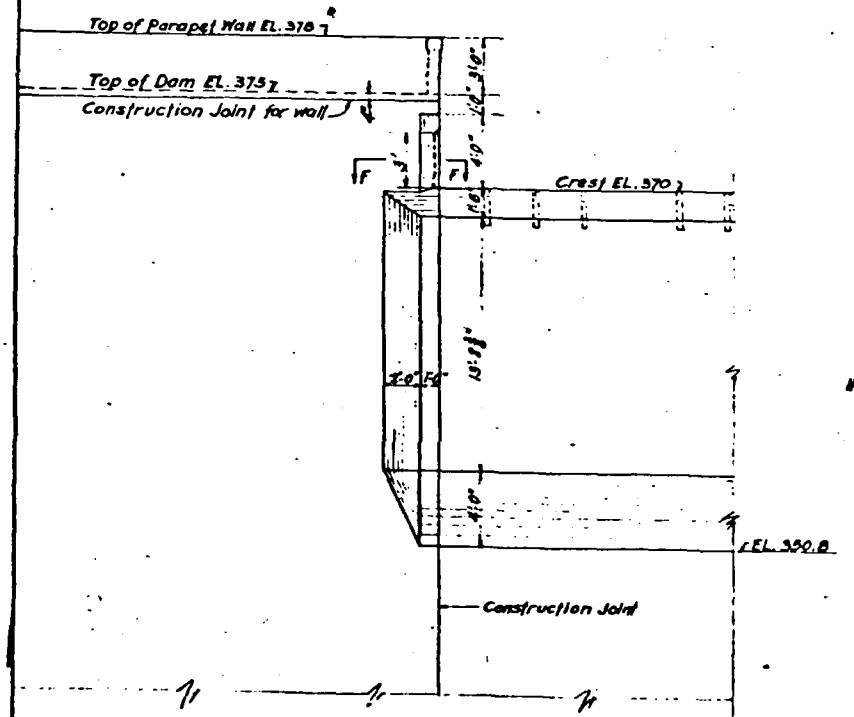
Drawn | Checked | Examined | Approved



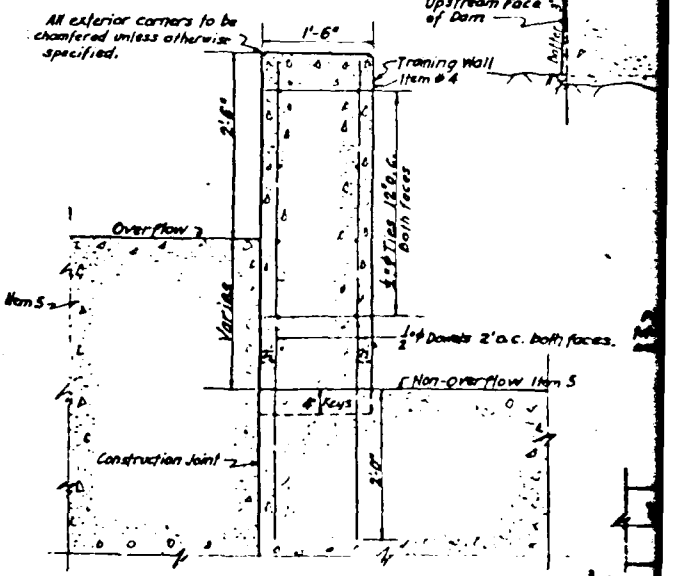
TOP PLAN AT JUNCTION OF DAMS
(Right bank similar but opposite hand.)
Scale $\frac{1}{4}$"=1'-0"



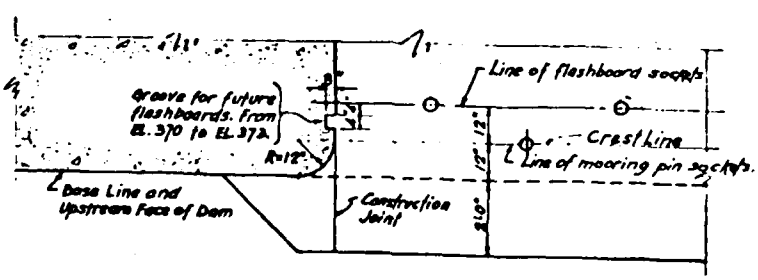
SECTION A-A
Scale 1"=1'-0"



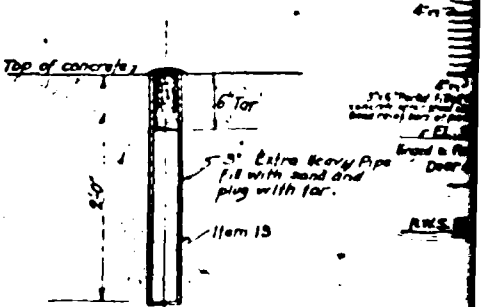
ELEVATION AT JUNCTION OF DAMS



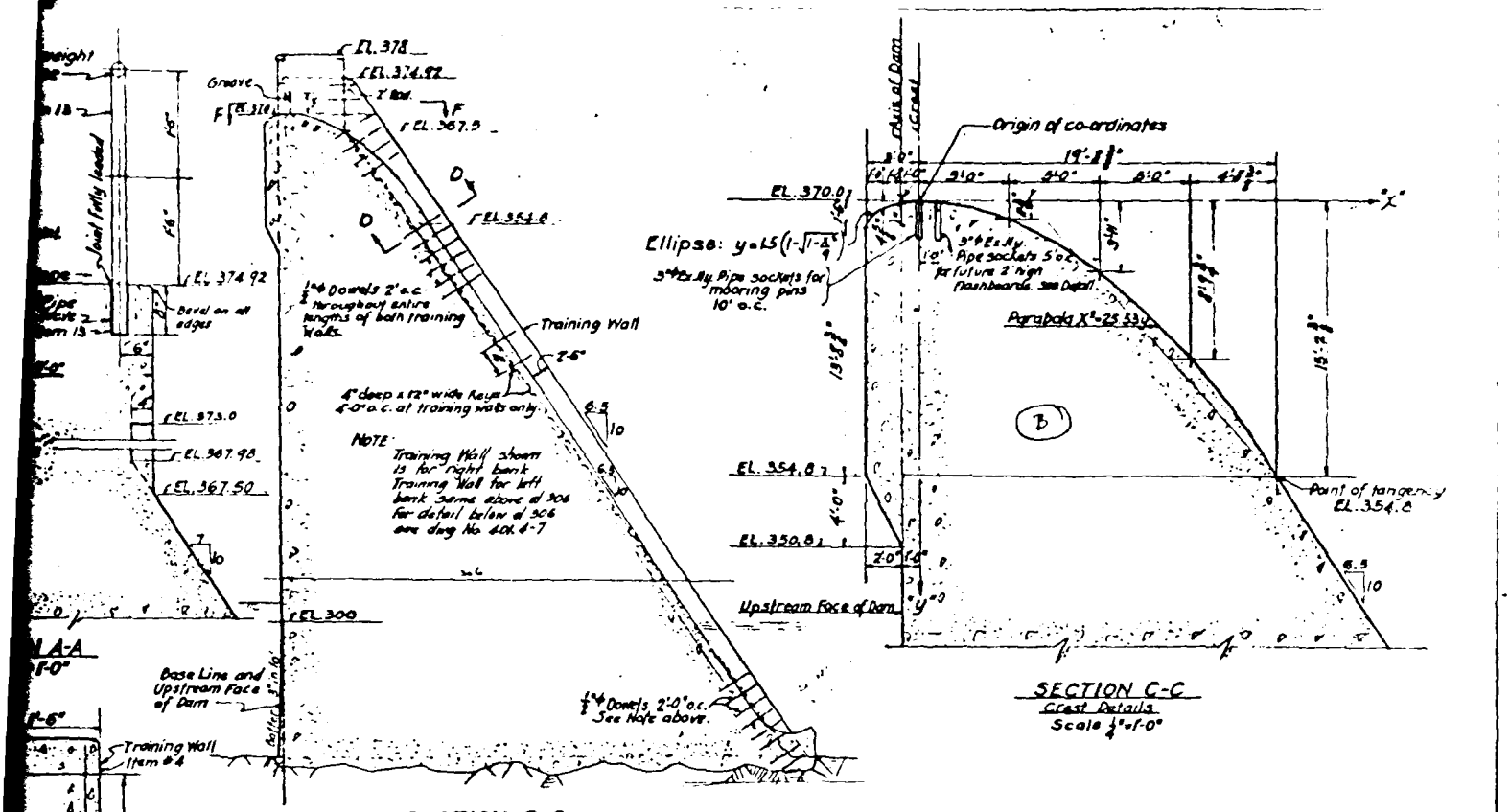
SECTION D-D
Scale 1"=1'-0"



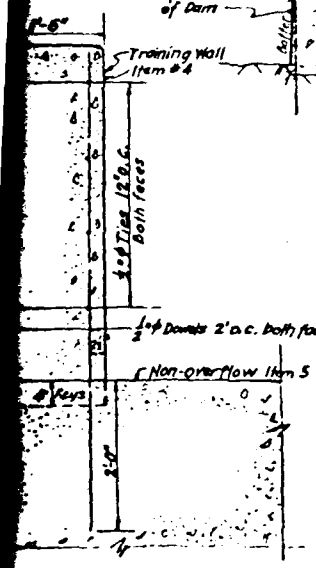
SECTION F-F
Scale $\frac{1}{4}$"=1'-0"



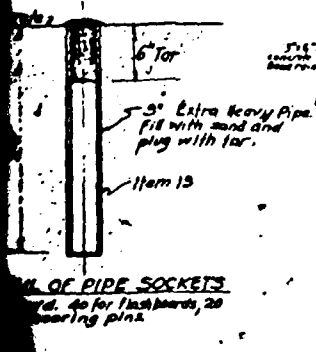
DETAIL OF PIPE SOCKETS
60 Req'd. 40 for flashboards, 20 for mooring pins



SECTION B-B
Scale 1"=10'

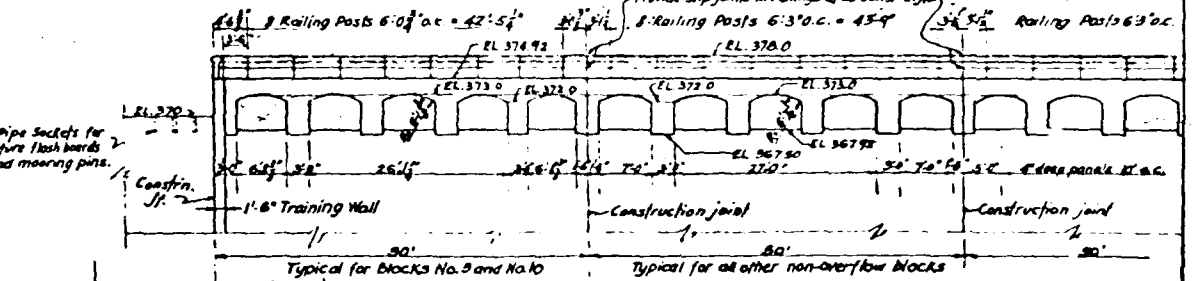


TION D-D
ale 1"=1'-0"

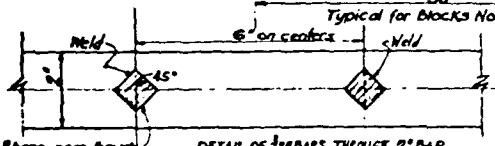


OF PIPE SOCKETS
rd. 40 for flashboards, 20 ooring pins

SECTION C-C
Crest Details
Scale ¼"=1'-0"

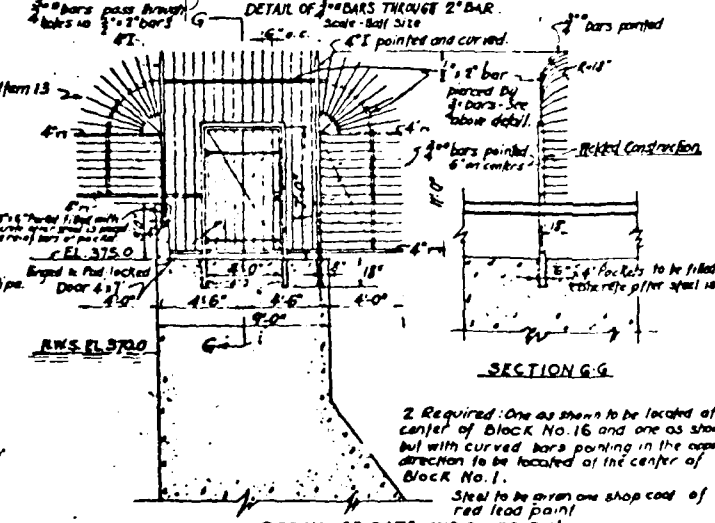


ELEVATION E-E
(Right bank similar but opposite hand.)
Scale 1"=10'



DETAIL OF ¾"ø BARS THROUGH 2" BAR.
Scale - Half Size

NOTES+
The details shown on this drawing are indicative of the type of structure intended and are subject to revision if found necessary during the progress of the work.
All elevations are referred to Mean Sea Level.



SECTION G-G

2 Required: One as shown to be located at center of Block No. 16 and one as shown but with curved bars pointing in the opposite direction to be located at the center of Block No. 1.
Steel to be given one shop coat of red lead paint

DETAIL OF GATE AND GUARD FAN
Scale ½"=1'-0"

DRAWING NO. 401.4-5

NORWALK, CONNECTICUT
FIRST TAXING DISTRICT

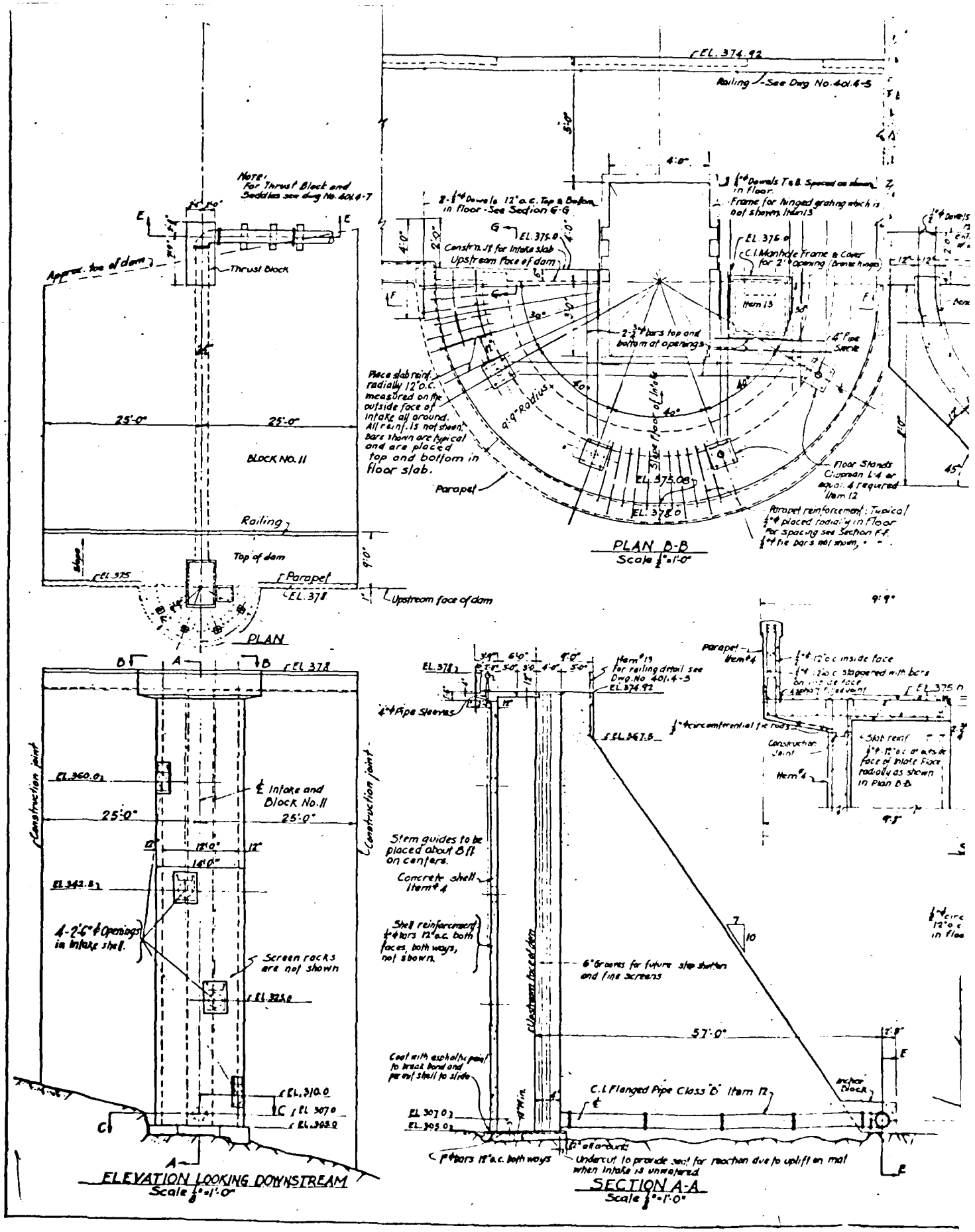
NORWALK LAKE DAM

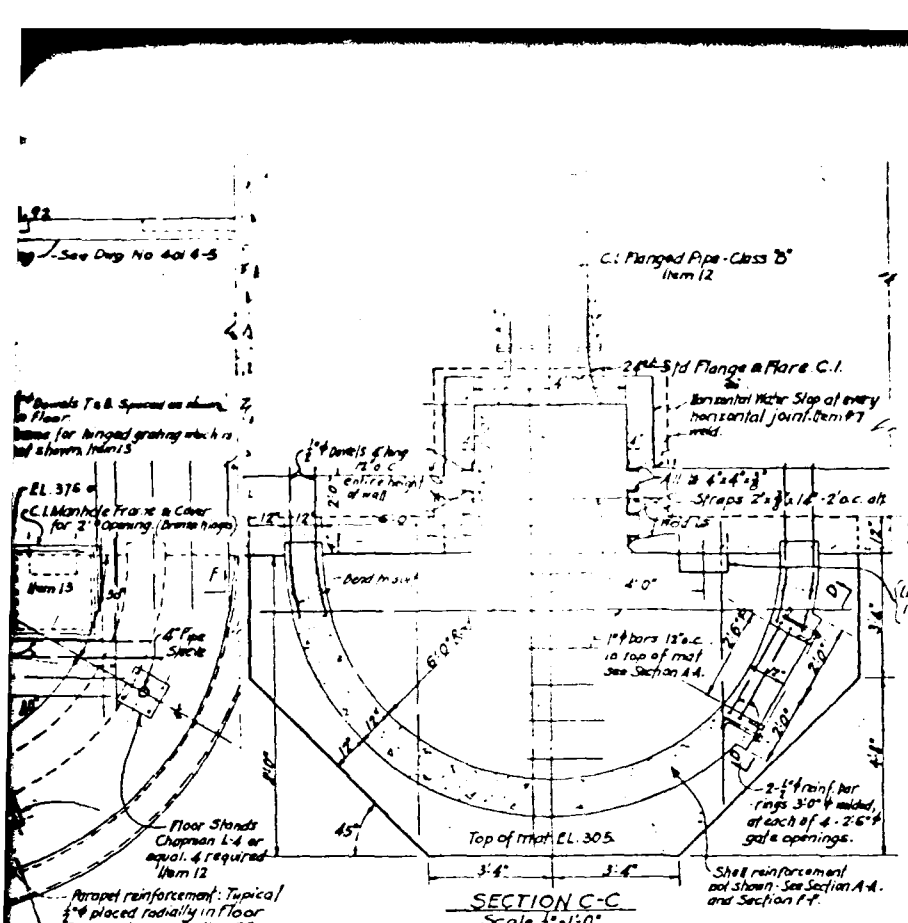
DETAILS OF TRAINING WALL & TOP OF DAM

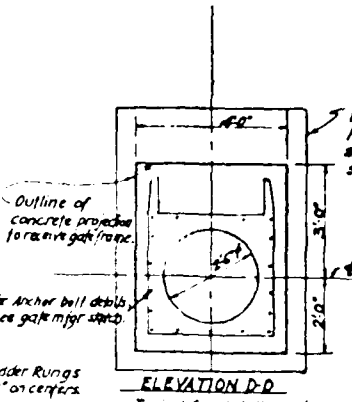
Buck, Seifert & Jost
Consulting Engineers
171 East 19th St
New York City

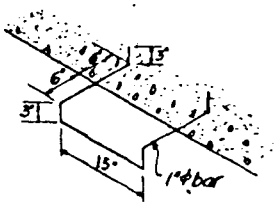
July, 1948

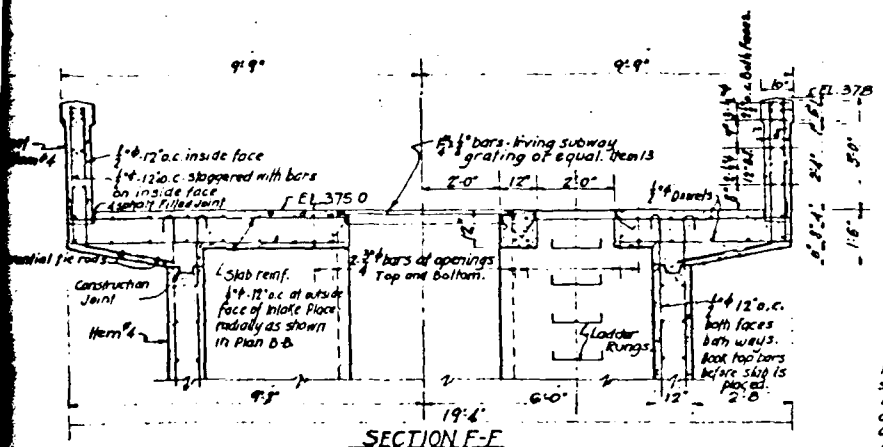
Drawn | Traced | Checked | Approved

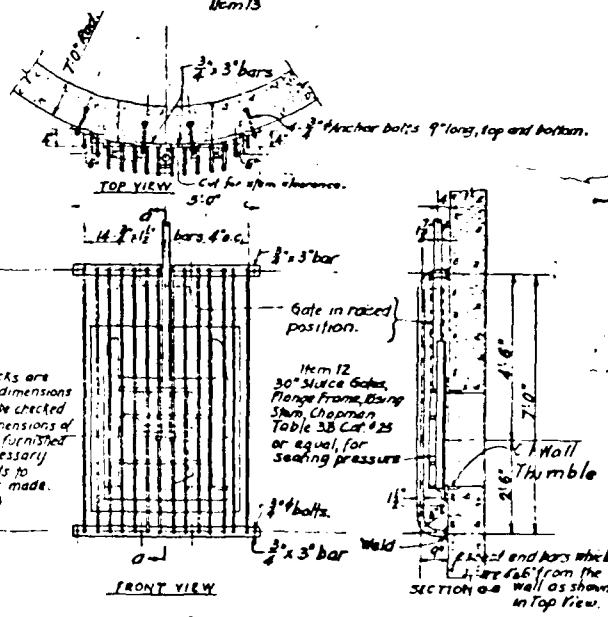

Note: For Thrust Block and Saddles see drwg No. 401.4-7
Approx. toe of dam
Thrust Block
25'-0"
25'-0"
BLOCK NO. 11
Railing
Top of dam
Slope
EL. 375
Parapet
EL. 378
Upstream face of dam
PLAN
EL. 374.92
Railing - See Drwg No. 401.4-5
8-1¼"ϕ Dowels 12" o.c. Top & Bottom in Floor - See Section G-G
3 1¼"ϕ Dowels T & B. Spaced as shown in Floor.
Frame for hinged grating which is not shown, Item 13
EL. 375.0
Constrn. Jt for Intake slab
Upstream face of dam
EL. 376.0
C.I. Manhole Frame & Cover for 2' Opening (Bronze hinges)
Item 13
2-3¼"ϕ bars top and bottom at openings
4" Pipe Sleeve
Place slab reinf. radially 12" o.c. measured on the outside face of intake all around. All reinf. is not shown; bars shown are typical and are placed top and bottom in floor slab.
9'-9" Radius
Slope floor of Intake
EL. 375.08
EL. 378.0
Parapet
Floor Stands Clipman L-4 or equal: 4 required Item 12
Parapet reinforcement: Typical ½"ϕ placed radially in Floor For Spacing see Section F-F. ½"ϕ tie bars not shown.
PLAN B-B
Scale ½"=1'-0"
B
A
B
EL. 378
Construction joint
EL. 360.0
℄ Intake and Block No. 11
25'-0"
25'-0"
12"
12'-0"
12"
14'-0"
EL. 342.8
4-2'-6"ϕ Openings in intake shell.
Screen racks are not shown
EL. 325.0
EL. 310.0
C
EL. 307.0
EL. 305.0
C
A
ELEVATION LOOKING DOWNSTREAM
Scale ½"=1'-0"
3'-9"
6'-0"
9'-0"
Item #13 for railing detail see Dwg No. 401.4-5
EL. 378
EL. 374.92
4"ϕ Pipe Sleeves
EL. 367.8
Stem guides to be placed about 8 ft on centers.
Concrete shell Item #4
Shell reinforcement ½"ϕ bars 12" o.c. both faces, both ways, not shown.
6" Grooves for future slip shutters and fine screens
Upstream face of dam
Coat with asphaltic paint to break bond and permit shell to slide
EL. 307.0
EL. 305.0
½"ϕ bars 18" o.c. both ways
12" all around
Undercut to provide seat for reaction due to uplift on mat when intake is unwatered
57'-0"
7
10
C.I. Flanged Pipe Class 'B' Item 12
Anchor Block
E
E
SECTION A-A
Scale ½"=1'-0"
9'-9"
Parapet Item #4
½"ϕ 12" o.c. inside face
½"ϕ 12" o.c. staggered with bars on inside face
EL. 375.0
½"ϕ circumferential tie rods
Construction Joint
Slab reinf ½"ϕ 12" o.c. at outside face of intake floor radially as shown in Plan B-B
Item #4
45°

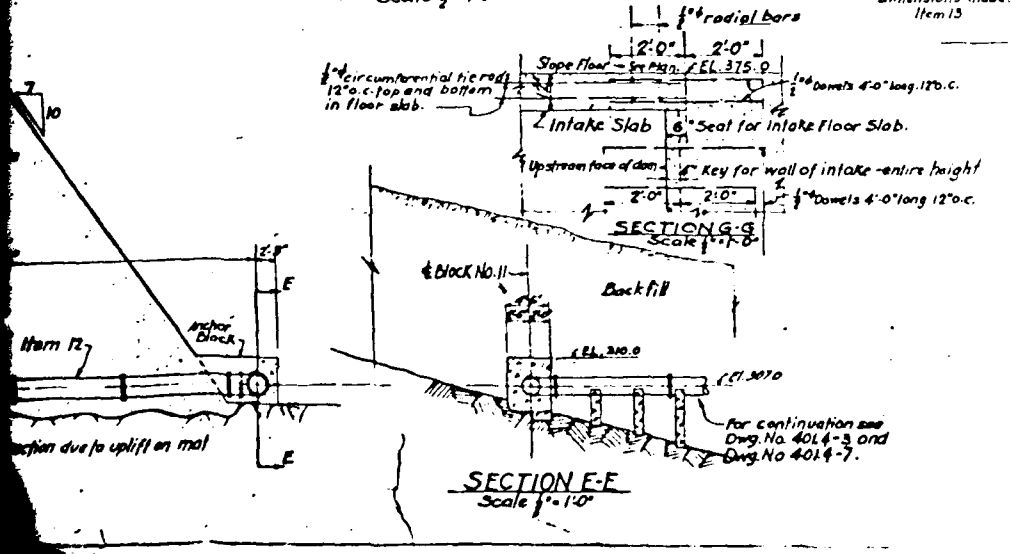












NOTES:
The details shown on this drawing are indicative of the type of structure intended and are subject to revision if found necessary during the progress of the work.
All elevations are referred to Mean Sea Level.

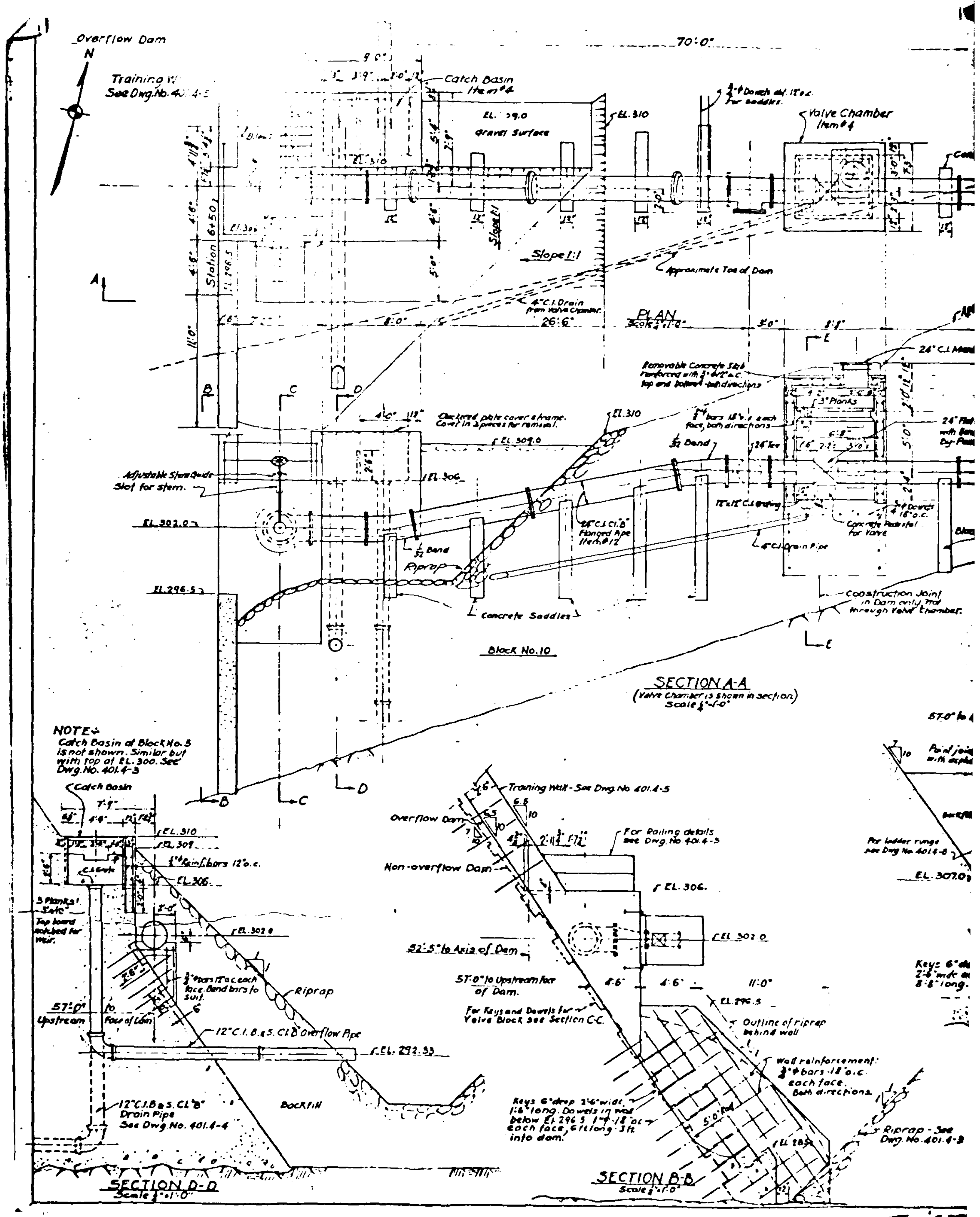
DRAWING NO. 401.4-6

NORWALK, CONNECTICUT
FIRST TAXING DISTRICT
NORWALK LAKE DAM
DETAILS OF INTAKE

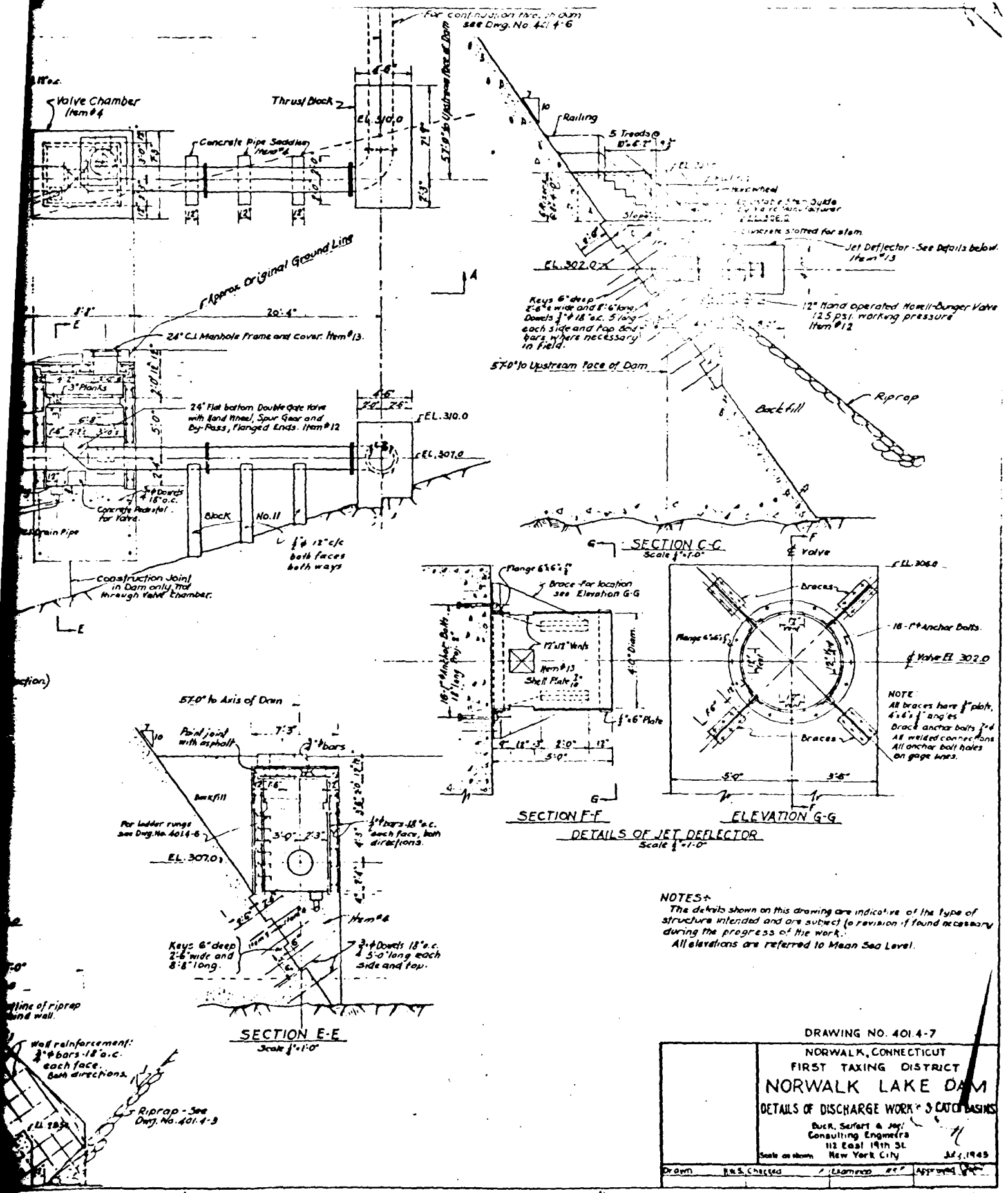
Buck, Seifert & Jost
Consulting Engineers
12 East 19th St
New York City

Scale: as shown — July, 1943

Drawn — Checked — Examined — Approved



Overflow Dam
N
Catch Basin Item #4
EL. 310
Gravel Surface
Valve Chamber Item #4
Slope 1:1
Approximate Toe of Dam
4" C.I. Drain from Valve Chamber
PLAN
26'-6"
70'-0"
Station 6+50
Removable Concrete Slab
Checkered plate cover & frame. Cover in 3 pieces for removal.
EL. 309.0
EL. 306
EL. 302.0
EL. 296.5
Adjustable Stem Guide
Slot for stem.
1/32 Bend
24" C.I. Cl.B Flanged Pipe Item #12
Riprap
Concrete Saddles
4" C.I. Drain Pipe
Concrete Pedestal for Valve
Construction Joint in Dam only, not through Valve Chamber.
Block No. 10
SECTION A-A
(Valve Chamber is shown in section)
NOTE:-
Catch Basin at Block No. 3 is not shown. Similar but with top at EL. 300. See Dwg. No. 401.4-3
Catch Basin
EL. 310
EL. 309
EL. 306
EL. 302.0
Riprap
57'-0" to Upstream Face of Dam
12" C.I.B.&S. Cl.B Overflow Pipe
EL. 292.33
12" C.I.B.&S. Cl."B" Drain Pipe See Dwg. No. 401.4-4
Backfill
SECTION D-D
Training Wall - See Dwg. No. 401.4-5
Overflow Dam
Non-overflow Dam
For Railing details see Dwg. No. 401.4-5
EL. 306.
EL. 302.0
52'-5" to Axis of Dam
57'-0" to Upstream Face of Dam.
For Keys and Dowels for Valve Block see Section C-C.
EL. 296.5
Outline of riprap behind wall
Wall reinforcement: 3/4" φ bars - 18" o.c. each face. Both directions.
Keys 6" deep 2'-6" wide, 1'-6" long. Dowels in wall below EL. 296.5 1"φ-18" o.c. each face, 6 ft long, 3 ft into dam.
Riprap - See Dwg. No. 401.4-3
SECTION B-B
For ladder rungs see Dwg. No. 401.4-8
EL. 307.0



NOTES:
The details shown on this drawing are indicative of the type of structure intended and are subject to revision if found necessary during the progress of the work.
All elevations are referred to Mean Sea Level.

DRAWING NO. 401.4-7

NORWALK, CONNECTICUT
FIRST TAXING DISTRICT
NORWALK LAKE DAM
DETAILS OF DISCHARGE WORKS & CATCH BASINS

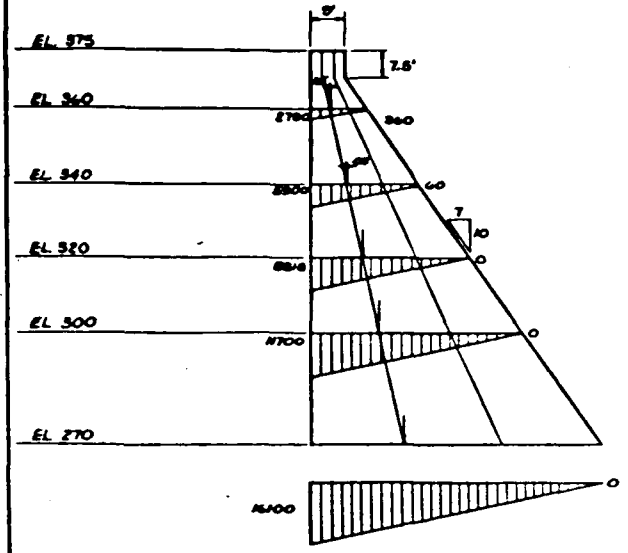
Buck, Seifert & Jost
Consulting Engineers
112 East 19th St.
New York City

Scale as shown — Jul 3, 1945

Drawn — B.H.S. Checked — Examined — Approved

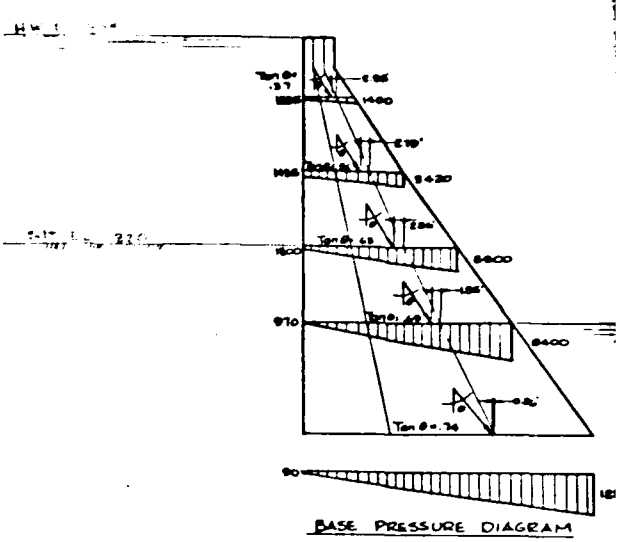
NON-OVERFLOW DAM

RESERVOIR EMPTY



BASE PRESSURE DIAGRAM

RESERVOIR AT FLOOD EL 375

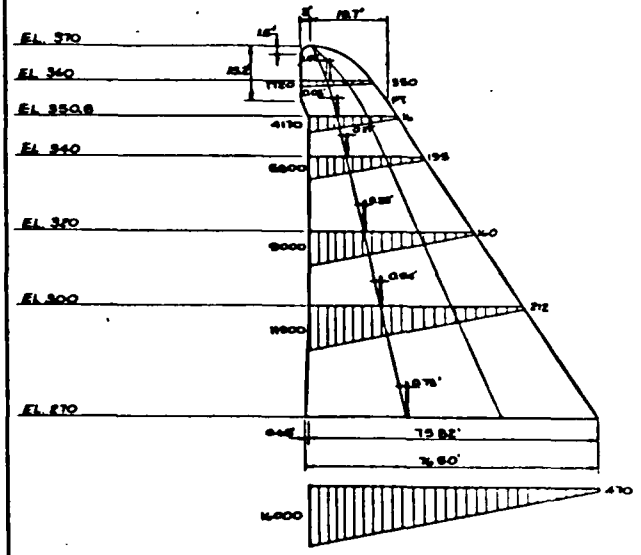


BASE PRESSURE DIAGRAM

UPLIFT DIAGRAM - TYPICAL

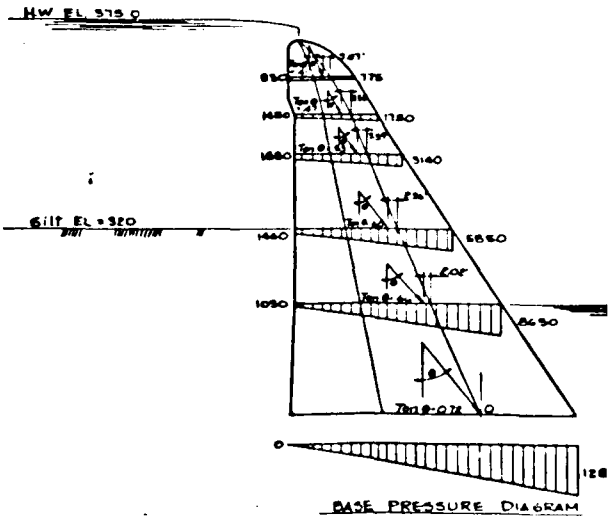
OVERFLOW DAM

RESERVOIR EMPTY

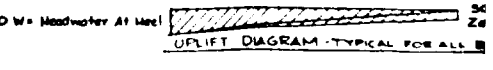


BASE PRESSURE DIAGRAM

RESERVOIR AT FLOOD EL 375



BASE PRESSURE DIAGRAM



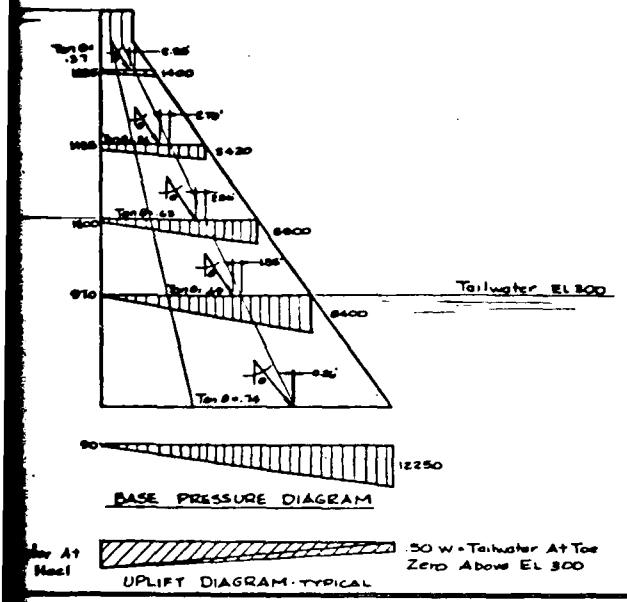
UPLIFT DIAGRAM - TYPICAL FOR ALL

BASIS OF DES

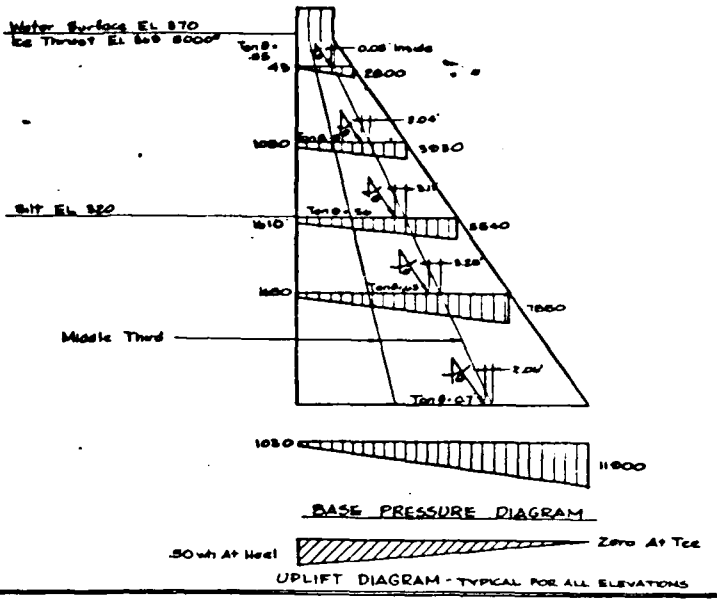
Concrete Fig
Silt From
Maximum Si
Ice Pressure
Tailwater Ele
Uplift 50% C

NON-OVERFLOW DAM

ERVOIR AT FLOOD EL 375

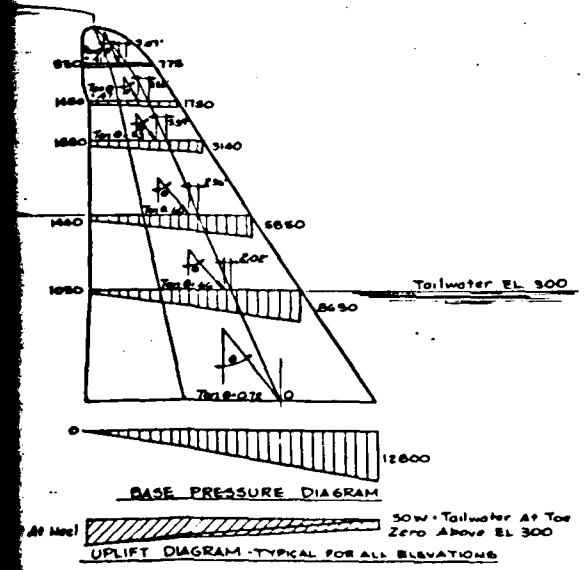


RESERVOIR AT CREST EL 370 PLUS ICE

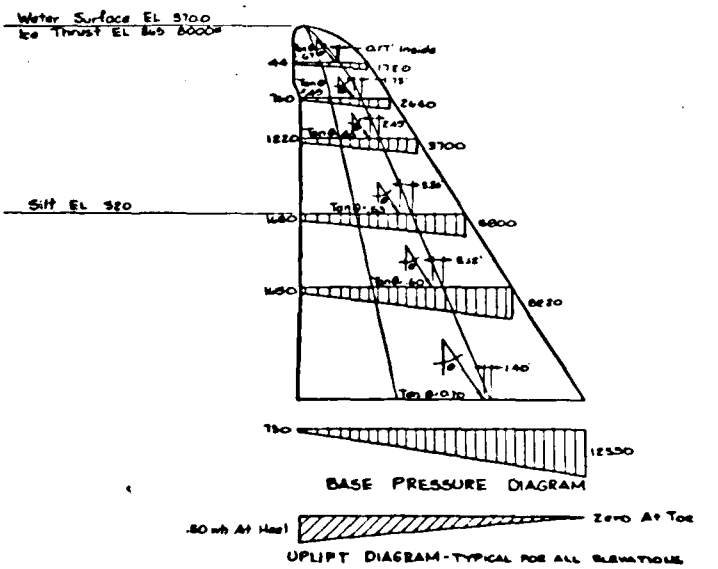


OVERFLOW DAM

ESERVOIR AT FLOOD EL 375



RESERVOIR AT CREST EL 370 PLUS ICE



BASIS OF DESIGN

Concrete Figured At 145 Pounds Per Cubic Foot
Silt From Elevation 320 At 90 Pounds Per Cubic Foot
Maximum Sliding Factor 0.75
Ice Pressure 3000 Pounds Applied At Elevation 369
Tailwater Elevation For Flood Conditions 300
Uplift 50% Of Headwater To 50% Tailwater Over Full Area.

NOTE = Stresses Are Pounds Per Square Foot.

DRAWING NO. 401.4-B

NORWALK, CONNECTICUT
FIRST TAXING DISTRICT

NORWALK LAKE DAM
STRESS DIAGRAMS

Buck, Seifert & Jost
Consulting Engineers
112 East 19th St
New York City

Scale As Shown — July, 1948

Drawn	H.W.S.	Checked	F.	Examined	H.E.F.	Approved

APPENDIX VI

INFORMATION AS CONTAINED IN

THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

STATE	IDENTITY NUMBER	DIVISION	STATE COUNTY	CONGR DIST	STATE	COUNTY	CONGR DIST	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE DAY	MO	YR
CT	5P	NED	CT 001	05				JOHN D MILNE DAM	4112.1	7329.6	16	AUG	78

POPULAR NAME	NAME OF IMPOUNDMENT
	JOHN D MILNE LAKE

REGION BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI.)	POPULATION
01 07	SILVERMINE RIVER	PINE HILL	2	1200

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	IMPOUNDING CAPACITIES NORMAL (ACRE-FT.)	DIST	OWN	FED K	PRV/FED	SCS A	VER/DATE
CTPG	1947	S	80	75	1000	900	NED	N	N	N	N	16AUG78

REMARKS

D/S HAS	SPILLWAY CREST LENGTH	SPILLWAY TYPE	SPILLWAY WIDTH (FT.)	MAXIMUM DISCHARGE (CFS)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (MW)	POWER CAPACITY PROPOSED (MW)	NAVIGATION LOCKS NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
1	900	C	200	8000	77000											

OWNER	ENGINEERING BY	CONSTRUCTION BY
FIRST DIST WATER DEPT	BUCK SEIFERT JOST	EW FOLEY CO INC

REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

INSPECTION BY	INSPECTION DATE DAY MO YR	AUTHORITY FOR INSPECTION
FLAHERTY-GIAVARA, ASSOC, PC	01JUN78	PL 92 367

REMARKS

Item 12
anchor block
action due to uplift on mat